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OREGON SOLID WASTE MANAGEMENT PLAN: STATUS REPORT 1969

Oregon State Board of Health
Salem, Oregon

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SOLID WASTE MANAGEMENT PLAN

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status report 1969

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Status Report 1969

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U.S. ENVIRONMENTAL PROTECTION AGENCY
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OREGON SOLID WASTE MANAGEMENT PLAN

TO ENCOURAGE SYSTEMATIC PLANNING for better management of the Nation's solid wastes, Congress in the 1965 Solid Waste Disposal Act provided grant monies for the States for solid waste planning.[1] By June 1966, fourteen States had met the stipulations of the Act and were embarked upon the planning process with the help of the Federal funds. Today, almost every State has applied for and received a solid waste planning grant.[2] From each of the grants the Federal government expects two practical results: first, a plan (and report) for the State's management of its solid wastes; second, development of an agency for the managing function.[3]

The present document publishes the Oregon plan, which was developed by the State under a Federal solid waste management planning grant that went into effect September 1, 1966. The plan reported on here is necessarily based upon existing data, technology, problems, and objectives. But, the planning process is dynamic; future revision is an important part of the process to take account of changing conditions and better

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[1]The Solid Waste Disposal Act; Title II of Public Law 89-272, 89th Congress, S.306, October 20, 1965. Washington, U.S. Government Printing Office, 1966. 5 p.

[2]Toftner, R. O., D. D. Swavely, W. T. Dehn, and B. L. Sweeney. State solid waste planning grants, agencies, and progress--1970. Public Health Service Publication No. 2109. Washington, U.S. Government Printing Office. (In press.)

[3]Toftner, R. O. Developing a State solid waste management plan. Public Health Service Publication No. 2031. Washington, U.S. Government Printing Office, 1970. 50 p.

data. Moreover, a plan is not an end in itself. Its formulation is the key to action: to legislation, standards, technical assistance, public relations, and enforcement.

Besides providing the State solid waste management agency with a guide for action, the State plan will help to guide local and regional solid waste planning and subsequent implementation. The plan can also provide support for improved State legislation related to solid waste management.

Oregon's plan is designed, therefore, to: (1) begin the planning process; (2) establish policies and procedures to guide the State solid waste agency; (3) guide regional planning; (4) provide a documented base for improved solid waste legislation and operating regulations. With these objectives in mind, this plan report presents and analyzes pertinent solid waste data, identifies problems indicated by the data, sets objectives that if achieved would solve identified problems, and finally, proposes immediate, intermediate, and long-range measures for achieving objectives. This plan should thus provide Oregon's solid waste agency with an invaluable management tool with which to begin solving the solid waste problems in the State of Oregon.

--RICHARD D. VAUGHAN
Assistant Surgeon General
Acting Commissioner
Solid Waste Management Office

INDEX

I. INTRODUCTION Page 1

II. SUMMARY OF DATA

A. General Information Page 5

B. Storage Page 6

C. Collection Page 6

D. Transportation Page 7

E. Disposal Page 7

F. Summary of Recommendations and Solutions Page 10

III. SOLID WASTE MANAGEMENT PRACTICES IN OREGON

A. History Page 12

B. Survey Procedures Page 17

C. Storage Practices Page 17

D. Collection Page 20

E. Long-Distance Hauling Methods Page 22

F. Disposal Facilities Page 25

IV. PROBLEMS AND NEEDS

A. General Information Page 46

B. Storage Page 46

C. Collection Page 48

D. Long-Distance Hauling Page 49

E. Disposal Page 50

F. Financing and Manpower Page 52

V. RECOMMENDATIONS FOR SOLUTIONS

A. General Recommendations Page 54

B. Recommended Solutions for Storage Page 56

C. Recommended Solutions for Collection and Transportation Page 57

D. Recommended Solutions for Disposal Page 57

VI. IMPLEMENTATION OF THE PLAN

A. Immediate Objectives Page 62

B. Intermediate Objectives Page 63

C. Long-Range Goals Page 64

ADDENDUM

A. SUGGESTED SOLID WASTE MANAGEMENT REGIONS Page 65

Western Oregon

(1) Clatsop, Tillamook Page 66

(2) Columbia, Washington, Multnomah, Clackamas Page 68

(3) Yamhill, Polk, Marion Page 70

(4) Lincoln, Benton, Linn Page 72

(5) Lane Page 74

(6) Douglas Page 76

(7) Coos, Curry Page 78

(8) Josephine, Jackson Page 80

Eastern Oregon

(9) Hood River, Wasco, Sherman Page 82

(10) Jefferson, Crook, Deschutes Page 84

(11) Klamath, Lake Page 86

(12) Umatilla, Morrow, Gilliam, Wheeler, Grant Page 88

(13) Baker, Union, Wallowa Page 91

(14) Harney, Malheur Page 93

B. Proposed County Solid Waste Committees Page 95

C. Proposed Inspection Forms Pages 96-98

D. Rules and Regulations Page 99

E. Background Information Necessary for Planning

A. Political Structure of State Page 104

B. Environmental Resources Page 107

C. Human Resource Planning Page 117

References Cited Page 125

I. INTRODUCTION

This "Status Report 1969 -- Solid Waste Practices in Oregon" brings together for the first time, information on solid waste handling in every area of the state of Oregon. The information was compiled from a three-year study beginning September 1, 1966, and ending January, 1969. The study was funded by a federal grant, applied for by the Sanitation Section of the Oregon State Board of Health and awarded by the Solid Wastes Program, National Center for Urban and Industrial Health, United States Public Health Service.

The survey information is from a total of 231 solid waste disposal sites in Oregon and 120 communities. Information was gathered by personal interviews, field visits and record checks.

A. Rationale of the Study

Solid waste is produced by every activity of mankind. Because man can neither create nor destroy matter, solid waste will not disappear. It must be managed, stored or re-used.

The storage, collection, transportation and disposal of garbage, or "solid waste" as it is now termed, has been a continuing concern for the past 5,000 years as evidenced by records of the Valley of the Indus River in India and the following historical records:

> "In some of the two-storied houses, bathrooms and drains were found in the upper story. There were rubbish chutes or flues in the hollows of the walls leading down from the upper stories into bins. At convenient places by the roadside were public bins."[1]

> "In 1610, the first hygiene law was passed in Virginia; in 1874, Fryer built a furnace incinerator for refuse at Nottingham, England; and in 1886, the first American garbage reduction plant was built in Buffalo, New York."[2]

In Oregon, the first mention of garbage and refuse was made in the reports of the Board of Health when the 1904 Heppner Flood was reported in "Twenty-Five Years of Public Health in Oregon -- The Woods Hutchinson Regime."[3]

The first rules and regulations passed by the Board of Health that incorporated controls of garbage were those for Tourist Camp regulations which were adopted March 25, 1925.[3] Since that time, control of garbage or solid waste has been part of the work of the Sanitation Section of the state and county health departments.[3]

Emphasis of the early sanitation rules and regulations on garbage was only on storage and removal from the premises, and little mention was made of disposal until 1941 at which time garbage disposal was made part of the program of the Environmental Sanitation Section. No laws were passed to control solid waste disposal, but the need was noted.

For more than 20 years, the program operated without supportive state laws. A county-wide vector control demonstration project in Umatilla County was funded by the United States Public Health Service in 1957. The need for data for program planning and legislative action to control solid waste on a state-wide basis was evident from this study.

To meet this need, the Environmental Sanitation Section of the State Board of Health applied for a planning grant from the United States Public Health Service under the Solid Waste Disposal Act of 1965.[4]

B. Scope and Objectives

The increasing population, urbanization and industrialization of western Oregon and the increasing intensive agricultural practices

in eastern Oregon and the increased solid wastes from these activities pointed up the need for a definitive state-wide plan for solid waste management.

The following objectives were proposed for the grant application:

1. To strengthen and enlarge current solid waste activities which existed within the Vector Control Program of the Division of Sanitation and Engineering, Oregon State Board of Health.
2. To evaluate, in detail, the current disposal practices and problems in each community or area in Oregon, including promiscuous dumping problems where prevalent.
3. To forecast future needs of sanitary waste disposal considering the total ecology (demography, geology, meterology, transportation systems, etc.) of each distinctive area in Oregon. Ecologically distinct regions will be precisely delineated during the evaluation study.
4. To develop long-range plans for sanitary handling of solid waste for each region.
5. To gain acceptance to the plans by the governmental jurisdictions involved in each region.
6. To strengthen and enlarge upon chains of communications between the planning agency (Oregon State Board of Health) and local political entities so that the master plan developed may be implemented.
7. To implement the plans through consultation and technical assistance by the Oregon State Board of Health.

The first phase was to survey the problem. The second phase was to develop a preliminary plan for regional approaches, rules and regulations, enabling legislation for county and regional participation, and

to classify the wastes noted on the survey. The third phase is to be the development and implementation of a state-wide plan.

C. Extent of Report

Because of lack of time and personnel, the following report and plan is for commercial-residential solid waste only. The report will be expanded when more data is available on industrial and agricultural waste.

II. SUMMARY OF DATA

The survey data collected is summarized briefly. Only 5% of the disposal sites kept records of volumes received, so information is estimated by the operators and program personnel. From the data, the following can be deducted:

A. General Information

1. Yearly cost of operation of solid waste disposal sites for each person in Oregon at the time of the survey is equivalent to the cost of 3 Sunday editions of the metropolitan newspaper (less than $1 per year). This cost is paid through licenses or permits of the collector or, in a few counties, through tax funds.

   The disposal methods are inadequate and improvements will raise the operational cost.

2. The yearly cost of collection for the majority of households receiving regularly-scheduled collections is $21 for one can per week. Some pay as much as $24 for one can per week.

3. The volume of waste generated in Oregon, if estimated at 4.5 pounds per person per day, would result in 1,647,221 tons per year, but only 1,161,238 tons per year were estimated to be deposited at authorized disposal sites during the survey. These figures relate to commercial-residential waste primarily and indicate that one-fourth of this waste does not get to a disposal site, but is left on site, deposited illegally or burned.

   Waste disposal sites cover 8.1 square miles in Oregon, or about 113 square feet per person (enough space to make one 10 x 10 foot room for each person).

4. The increase in volume of waste is dependent on changes in pack-

aging, marketing and population.

For 1985, Bell Telephone Company estimates the population for Oregon to be 2,898,300 people.

The increase in commercial-domestic waste may increase to six pounds per person per day to give a total of 3,173,748 tons, or a yearly increase in production rates of 1,526,527 tons, or nearly double that now produced.

5. Volumes of industrial wastes are not estimated, but more will be going to public disposal sites as industries become less able to handle solid wastes on their own sites.

B. Storage

Visits were made to 120 communities and storage was evaluated.

About 27, or 25%, of the 120 communities indicated they had control of storage practices. Average-size containers of 25-30 gallon capacity were used in 89 communities (74%) and 32-50 gallon units were used in 30 communities (20%).

Ordinances banning backyard burning or garbage have been adopted by only 1 community in Oregon. One-hundred nineteen communities allow backyard burning with fire protection controls, and 75% of the cities surveyed indicated that backyard burning was a general practice.

Garbage was wrapped in 57 communities (57%) and stayed on-premise one week or less in all the communities in areas receiving collection services. Refuse and rubbish were noted on many premises in all communities, but no counts of premises or estimates of volume were made.

Storage of derelict vehicles on streets was controllable or ordinance in 32 communities (26%).

C. Collection

By estimate and records of collectors, only 85% of the urban population was served by collection services and no estimate was made of rural areas. Collection services are not provided in 106 communities and rural areas.

Special wastes such as car bodies, demolition wastes and dead animals were not collected routinely in nearly all cities (99%). These wastes would be collected on request, but only 8% would collect car bodies if requested. Vehicles used by regular collectors were of good design in 83% of the cases. Wastes collected routinely do not represent total waste produced.

D. Transportation

Long-distance transportation of refuse (over 25 miles) is not practiced in Oregon except for some specific industrial wastes transported by barge or truck.

Rail haul and transfer stations are being contemplated in some areas.

E. Disposal

Land disposal is the principal method of solid waste disposal within the state of Oregon. Over one-half of the land disposal sites are classified as open-burning sites, while 70% rely on burning in some manner to reduce waste volumes. Unauthorized disposal sites out-number the authorized sites three to one.

The majority of the authorized disposal sites are owned and operated by governmental agencies; 63% and 59% respectively. Sixty-four per cent of the sites operated by governmental agencies were operated by county level agencies, while 42% of the governmentally-operated sites were operated by municipal level agencies.

Operation costs for authorized disposal sites are extremely varied.

It is estimated that 65% of the authorized sites in Oregon operated on $2,000 or less annually. Twenty sites (9%) operated at an annual cost in excess of $10,000. The total cost of 155 authorized sites for which data was obtained was $1,584,000 annually (1967).

The majority of the authorized sites in Oregon do not keep accurate records of waste amounts received. However, data was obtained for 155 of the 231 authorized sites and calculations indicate that these sites received at least 1,123,240 tons during 1967 (7,285,000 cubic yards). The smallest amount received by an authorized site was 2 tons and the largest amount was 302,000 tons per year, thus indicating the considerable range in waste amounts received. Seventy-six per cent of the 231 sites receive 2,000 tons or less of solid wastes annually.

Solid wastes reach the authorized disposal sites by three methods - 1. Publicly-owned collection vehicles; 2. Privately-owned collection vehicles; and 3. Miscellaneous vehicles (cars, pickups, trailers, etc.). The number of loads transported by the third method is 6 times greater than private and public collection vehicles, but the volume of these loads represent only 25% of the total amount of wastes received at authorized disposal sites. Thus, the majority of waste volumes (75%) are being transported to the sites by public and private collection vehicles.

The majority (93%) of authorized disposal sites in Oregon are located in agricultural, undeveloped or forest areas. Only 9% of the sites surveyed had definite plans for future use of the site upon completion. Seventy per cent of the authorized sites are located either in gullies or caryons or upon hillsides. The least number of

sites (5%) are located in marsh, tidal or flood plain areas.

Equipment used for compacting wastes at authorized sites in Oregon is primarily the crawler tractor. This particular piece of equipment is used at 95% of those sites providing compaction. Specially designed equipment for waste compaction, e.g., steel wheel compactors, is being used at some of the larger disposal sites.

Survey results revealed that 40% of the authorized disposal sites in Oregon have either potential or existing drainage problems. Twenty-two sites (10%) were experiencing leaching problems at the time of the survey.

Approximately 40% of the authorized disposal sites in Oregon need rodent control measures. Only 15% of the sites are providing control measures. Problems concerning flies were observed at 69% of the authorized sites, and only 4% of the sites were providing fly control measures.

The survey revealed that 103 (45%) of the 231 authorized sites in Oregon have no fire protection equipment or safeguards on site. Water under pressure at site was observed at 49 (21%) of the sites in Oregon.

Caretakers or site operators were observed at 95 (41%) of the authorized disposal sites in Oregon. All but 1 sanitary landfill (91%) had operators in attendance.

Salvaging is conducted at 91 (39%) of the total authorized disposal sites. Salvaging is permitted at 157 (68%) of the authorized sites.

Special wastes create a problem because of volume, type of waste and methods of handling. Wastes such as chemical-oil wastes, tires, septic tank sludge and demolition wastes are <u>not</u> taken in large volumes at most of the public sites in Oregon.

F. Summary of Recommendations and Solutions

The management of solid waste includes storage collection and disposal of solid wastes, and best management of these is necessary for the well-being of man. Therefore, solid waste management should be considered as a package and as a service utility similar to water and sewage services.

1. Financing and Management

(a) The greatest need is for people to recognize that waste management has a cost and method of financing this cost must be developed. Financing can be done through:

(1) Governmental subsidy from county or city taxes.

(2) Establishment of a separate service or tax district for financing purposes.

(3) User's fees collected at disposal sites.

(4) Increased fees for collection of waste to include disposal costs.

(b) Because nearly all the disposal sites are located in county areas outside of cities and are not well controlled by the city, the county government must assume the responsibility of solid waste disposal management, even to operation of sites if necessary.

2. Storage

Very few cities and only one county have ordinances controlling solid waste storage and removal. Ordinances fitting the local situation should be developed from state rules and regulations, to control all phases of storage and these should be enforced on the local level.

3. Collection and Transportation

   (a) Residential-commercial waste is collected and transported by private corporations in most of Oregon. A large portion of the general public haul their own garbage for various reasons.

   (b) Mandatory collection of waste with controls, such as franchise agreements, may be necessary in heavily populated areas.

   (c) Transfer stations or drop box services offered by governmental agencies may reduce the need for mandatory collection.

4. Disposal

   (a) The sanitary landfill is and will continue to be the most practical method of disposal for Oregon, for communities over 5,000 population (36).

   (b) The landfill, in which refuse is covered at regular intervals but not daily, will, of necessity, be the method of disposal acceptable for communities of less than 5,000 population (190).

   (c) Control and abandonment of unauthorized sites (640 or more) must be accomplished by county government and county funds.

   (d) Wastes of special nature such as automobiles, tires, chemical wastes and large volumes of demolition and industrial waste will need special handling for which new technologies and recycling will provide answers other than burying.

   (e) Land acquisition for disposal facilities must be planned for, included in all planning and zoning ordinances, and purchased many years in advance of actual need.

III. SOLID WASTE MANAGEMENT PRACTICES IN OREGON

A. History

1. Municipalities

The community or municipality was the first governmental agency in Oregon to face the solid waste problem.

At the turn of the century, solid waste consisted primarily of food wastes and ashes. Foods were sold in bulk from the store and carried home in a waxed paper container or sack. The used container made a good starter for the fire in the cookstove or furnace and the food waste went to the chickens or pigs for food.

After the first World War, the use of the open-top sanitary can for food became universal.[6] The rag man who collected most of the salvageable materials from clothes to metals was part of the American scene. Refuse collection was either part of the "rag man's" service or part of the animal feeder's service.

Controls for garbage on private premises were instituted in some cities in the early 1900s and were basically related to nuisance control and refuse removal. There was seldom any mention of disposal.

The first mention of garbage and offal in the annals of the Oregon State Board of Health referred to the accumulation of such debris in the town of Heppner during the Heppner Flood in Morrow County in 1904.[7]

2. Counties

The first county health department in Oregon was established in 1922 in Coos County.[8] Early involvement of the county health department with garbage was because of odors, nuisances, flies and

rodents.

It was not until 1945, when the restaurant program was established in the state, that counties were delegated direct control of garbage handling and storage on any premise by state law.

It was soon evident that on-premise storage was only a part of the garbage problem and it was necessary to have a suitable place to which garbage could be removed and disposed. The open-burning dumps in use only transferred the problems from the city lot to a larger problem area in the county.

Early in 1952, the Lane County Health Department embarked on a county-wide garbage disposal program.

In 1954, the Umatilla County Health Department sponsored the first field demonstration of a sanitary landfill operation at Milton-Freewater. The demonstration site was in a pea field owned by the city.

In 1958, Umatilla County and the Oregon State Board of Health were recipients of a grant for "Vector Control". This three-year project used community survey techniques and sanitary landfill promotion as the basis for vector control. One of the first multi-city landfills in the country was developed to serve the four towns of Weston, Adams, Athena and Helix in Umatilla County as a result of this project.

3. State

As stated before, the first mention or garbage in the Annual Reports of the Oregon State Board of Health was in connection with the 1904 Heppner Flood.

In 1925, the first rules and regulations dealing with general

sanitation were adopted to up-grade "Tourist Camps". These rules made reference to garbage storage and removal. The Biennial Report of July 1, 1924 to June 30, 1926 mentioned visits to two garbage disposal sites. The emphasis in these early years on water supplies, sewage disposal and swimming pools kept the one engineer on the staff busy.

In 1939, the State Sanitary Authority was formed and federal funding for this program allowed the expansion of the Sanitation and Engineering staff of the Board of Health. In the outline of staff duties for years 1940-1942, "Garbage Disposal" was listed and about 30 disposal site investigations were made during that biennium.

In 1960, as a result of the demonstration project conducted in Umatilla County, a staff position on the State Board of Health was given responsibility for solid waste supervision. In 1962, the State Air Pollution Authority took a vital interest in solid waste because of obvious relationships.

Because of a lack of state laws, a first need seemed to be legislative action. To support such action, an evaluation of the total problem was needed. The Federal Law, Public Law 89-272, title II, was passed in October, 1965, as an amendment to the Clean Air Act. This Act established funds for state planning. Oregon applied and was awarded grant funds to evaluate this problem and plan for solid waste management. The survey was for a three-year period beginning September, 1966.

In 1967, the Oregon Legislature passed a law establishing the Solid Waste Section of the Oregon State Board of Health. This law

required establishment of state-wide rules and regulations for storage, collection, transportation and disposal of solid waste from all sources, and enforcement of the regulations.

4. Future Trends

In examining the past history of solid waste disposal throughout Oregon, it is also necessary to recognize a pattern or reoccurrence of events which emerges and is somewhat responsible for present conditions and problems. A study of this pattern gives better understanding of the complexity and scope of the existing and future problems of solid waste management in Oregon.

For many years, open burning was the means and method of solid waste reduction and disposal. Some of the solid waste generated was burned at the point of origin and some was collected, transported and burned at specific locations. These specific locations were termed "dumps" or "garbage dumps". Some were privately owned and operated while others were located on public land and maintained by governmental agencies. These "dumps" were, for the most part, economically efficient. The operational cost of these sites could be measured in matches and gasoline. Fees collected for use of these sites were, therefore, nearly 100% profit. Income from fees could also be supplemented through the sale of certain salvageable materials. The open-burning dump could, therefore, be considered as a private enterprise or, if governmentally operated, self-sustaining. Although economical in operation, the open-burning dump had some drawbacks. Certain effects to the immediate environment, e.g., odors, insects, smoke and vermin, required that a dump be located a "tolerable" distance from any community or residence.

In most instances, this tolerable distance was a minimum of one mile.

As populations increased and rural areas underwent residential development (the urban sprawl), the "tolerable distance" of even many miles did not remove the "dumps" as a source of irritation to the public. State and local health officials were called upon to abate and eliminate the public health problems which accompany open-burning dump operations.

Accompanying the increase in population was an increase in waste generation per capita and a significant change in the composition of solid waste. Garbage or putrescible wastes were becoming a smaller portion of the total volume of solid waste, while cellulose, plastic and glass materials were steadily increasing. This can be attributed to the multitude of disposable items and packaging changes which were making their appearance.

The enactment of air quality control legislation and the subsequent enforcement had an immense impact upon solid waste disposal in areas of the state by curtailing much of the on-premise burning of solid wastes. These wastes, when not burned, increased the volumes of solid wastes hauled to disposal sites or just stored on premises. The same air pollution rules and regulations in many instances also required the elimination of open burning at the disposal sites. Thus, this chain of circumstances: an increase in population, an increase in waste production and an increase in environmental quality control standards, brought the unsatisfactory methods of solid waste disposal sharply into focus.

This survey report, authorized by Federal Grant #G05-UI-00014,

attempts to evaluate the problems and offers some approaches to correction of the problem.

B. Survey Procedures

The following data was obtained from a state-wide survey of Oregon authorized to start September 1, 1966 by a Federal Grant from the Solid Wastes Program, United States Public Health Service (Grant #5-S02-UI-00014-03; now Grant #G05-UI-00014) and matching state funds. Staffing for the survey was personnel from the Environmental Sanitation Section of the State Board of Health.

Information was gathered by personal visit of survey personnel and cooperating county health department sanitarians to the area and was obtained by personal observation and interviews with people working for the county, the city and private enterprise dealing with solid waste. Private collection firms and representatives were interviewed. Visits were completed to all 36 counties in Oregon by December, 1968, and to 120 incorporated communities in the state.

Information was compiled on survey forms developed by the state and transferred to forms supplied by the Solid Wastes Program of the United States Public Health Service. Data from the state forms was coded to be filed in the Data Processing Center of the Oregon State Board of Health and data from the federal forms was coded for the data processing and retrieval system of the Federal Government. Both retrieval systems were used for compilation of data in this report.

Because of lack of time, industrial and agricultural waste management practices are not fully reported, but will be included in an addendum.

C. Storage Practices - Commercial and Residential Solid Waste

1. Statutory Control

Of the 120 communities visited, 70 (58%) (Table I) municipalities indicated that they exercised no regulatory control over solid waste storage (response to question - 100%). Of the communities having ordinances, only 19% controlled putrescible waste storage. Demolition and construction waste storage was controlled in less than 10%.

Backyard burning was allowed in 119 communities and only 1 did not allow burning at all (less than 1%). Only 52 communities (43%) required some type of screened device for fire protection.

Thirty-two communities (26%) had statutory-regulatory control governing storage of derelict vehicles on public property.

TABLE I

STORAGE OF WASTE, BY TYPES, CONTROLLED BY COMMUNITY ORDINANCES (Some communities control more than one type of waste; response - 100%)

Type of Waste	Number of Cities	Percentile
Garbage	23	19%
Refuse	23	19%
Demolition Wastes	8	6%
Construction Wastes	7	5%
Industrial Wastes	10	8%
No Control	70	58%

TABLE II

GOVERNMENTAL LEVEL CONTROLLING STORAGE (response - 88%)

Governmental Level	Number of Cities	Percentile
Municipality	43	98%
County	1	2%
State	0	0%
Federal	0	0%
Other	0	0%

2. Tables III, IV and V show the practices of storage such as length of time before removal, sizes of containers used and wrapping of garbage.

TABLE III

LENGTH OF TIME GARBAGE REMAINS IN STORAGE - Residential

(response - 93%)

Time Period	Number of Cities	Percentile
24 hours	3	3%
48 hours	0	0%
72 hours	3	3%
4 days	0	0%
5 days	0	0%
1 week	108	94%
Over 2 weeks	0	0%

Commercial (response - 92.5%)

Time Period	Number of Cities	Percentile
24 hours	22	20%
48 hours	4	4%
72 hours	67	60%
4 days	1	1%
5 days	0	0%
1 week	17	15%
2 weeks	0	0%
Over 2 weeks	0	0%

TABLE IV

AVERAGE SIZE STORAGE CONTAINERS IN MUNICIPALITIES - Residential

Storage (response - 99.1%)

Size-Volume	Number of Cities	Percentile
20-25 gallons	0	0%
25-30 gallons	89	74%
32-50 gallons	30	26%

Commercial Storage (response - 97.5%)

Size-Volume	Number of Cities	Percentile
20-25 gallons	0	0%
25-30 gallons	36	30%
32-50 gallons	47	39%
1- 2 cu. yd.	32	26%
3- 4 cu. yd.	2	1.6%

TABLE V

RESIDENTIAL PRACTICE OF WRAPPING OR PACKAGING GARBAGE

(response - 100%)

	Number of Cities	Percentile
Yes	57	47%
No	63	53%

D. Collection

Solid waste, in most cases, must be moved from the site or premise where it is produced or stored. The survey attempts to evaluate the collection practices in the state.

Collection practices were surveyed in 120 of the 226 communities in the state. There are no regular collection services listed as avail-

able in the 106 communities not surveyed and few collection services were available to suburban and rural areas close to urban centers.

The total urban population in the 226 communities is 1,133,670. The total urban population (1967 estimate) in the 120 communities surveyed is 1,019,740, or 90% of the total urban population in the state. It is estimated that between 80% and 90% of the urban population has collection services available.

Ninety-five per cent of the 120 communities surveyed have weekly collection; one and one-half per cent have twice-weekly collection; and less than one per cent have no collection. At least 856 man-years are involved per year to give this collection service.

TYPES OF VEHICLES USED

Type	Residential-Commercial Garbage
Number of closed (packer vehicles)	443 (83%)
Number of open-bed design	86 (16%)
TOTAL	529

TABLE VI

COMMUNITY COLLECTION OF SPECIAL WASTE

Type of Waste	None	Weekly	Annual	Request Only
Demolition waste	20%	1%	1%	76%
Car bodies	90%	0%	1%	8%
Dead animals	62%	0%	0%	37%

TABLE VII

COLLECTION AGREEMENT OR CONTRACT

Type of Agreement	Number of Communities	Percentile
Private contract	15	12%
Private franchise	86	72%
Municipal operation	5	4%
Licensing	2	1%
No agreement	9	8%
Franchise & contract	1	1%
Municipal & franchise	1	1%
No collection	1	1%
TOTAL	120	100%

In the 52 communities in Oregon surveyed, about 98% indicated that they exercised control over collection of solid waste by ordinance, but only 20% supervised the collection performance and this was through the public works department.

In these 52 communities, the following table indicates the agency performing the collection work, by type of solid waste.

TABLE VIII

COLLECTION PERFORMED BY AGENCY

Type of Solid Waste	Public Agency	Private Collector	Individual Citizen
Household wastes	3 %	76 %	20 %
Commercial wastes	2 %	81 %	15 %
Industrial wastes	1.6%	37 %	60 %
Institutional wastes	2.5%	86 %	10.7%
Dead animals	42 %	35 %	22.5%
Abandoned vehicles	45 %	2.1%	51.9%

There are 36 communities in Oregon over 5,000 population and all of these were included in the above figures.

E. Long-Distance Hauling Methods

The practice of long-distance hauling of solid wastes in Oregon which would involve methods of transportation other than the regular collection

vehicle and its trip to a nearby disposal site are very limited. This is because disposal sites may still be located near areas being served. However, special wastes and methods of disposal of these wastes now require longer hauls in special types of transportation.

One method of long-distance hauling is the barge system with wastes hauled primarily from Portland. Two types of wastes are barged. One type is the sulfite wastes from the pulp and paper industries. The other type is demolition waste from buildings or from ship dismantling. Barge disposal takes place in the Columbia River area, either in the stream or on shore, or at sea.

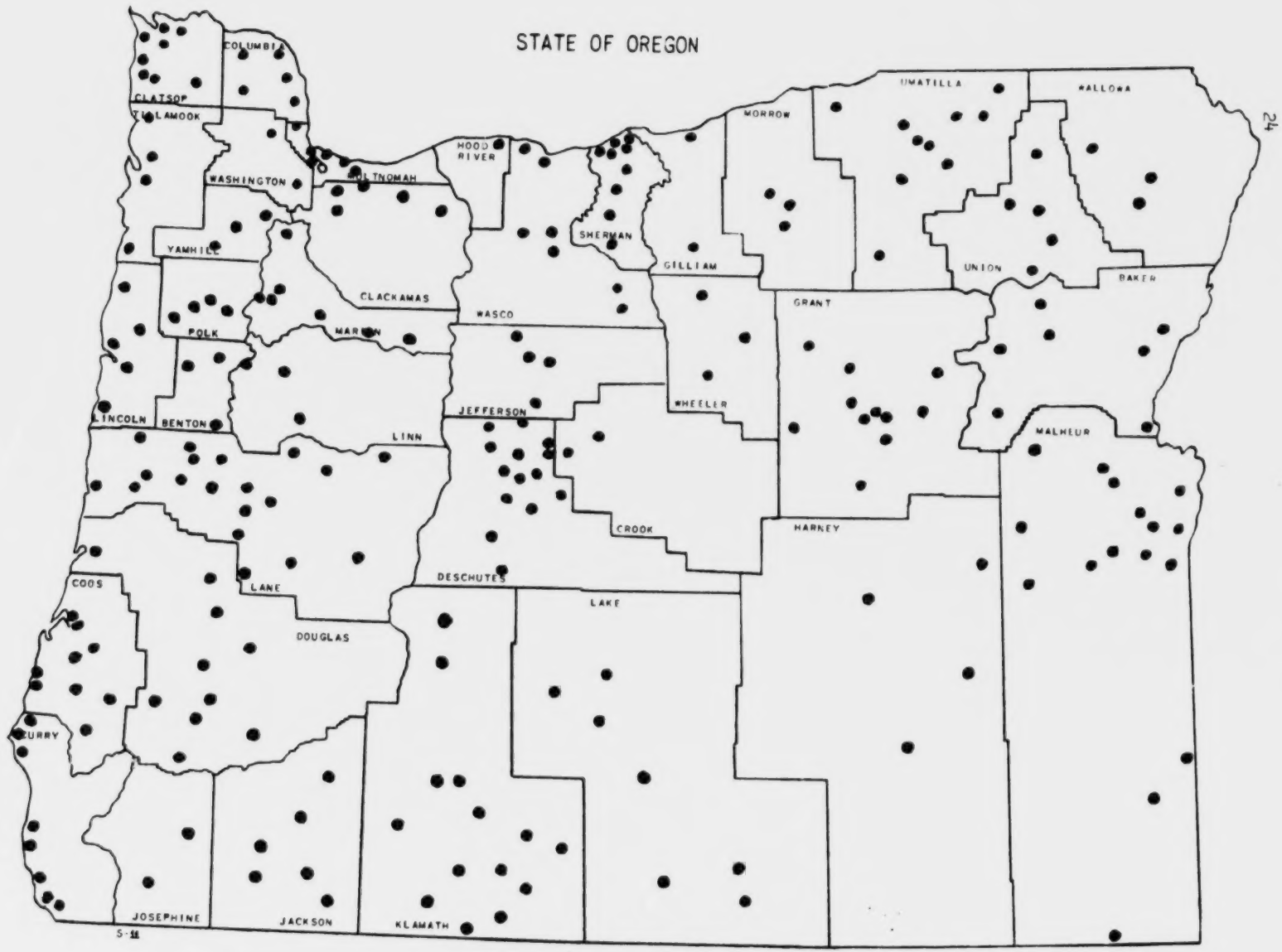
Another method of long-distance hauling practiced in Oregon is special trucking. Wastes hauled in this manner are petro-chemical wastes. Oil wastes have been hauled to the state of Washington and to forest areas for disposal. Chemical wastes have been trucked to Richland, Washington, for disposal or to eastern Oregon for storage.

An experimental method of combined storage-transportation has been tried in Benton County and this method included the placement of a drop-box in a rural area which was picked up, hauled 30 miles and emptied at a community disposal site. This is the only example in Oregon that might be related to a "transfer station" type of operation.

There have been proposals made in various studies for using the above methods of transportation and transfer stations and one additional proposal is being considered for rail hauling in the Portland area.

Another method of long-distance hauling mentioned for Oregon is the closed pipeline method.

Some wastes are being transported across county and state lines in Curry, Umatilla, Malheur and Multnomah Counties.


STATE OF OREGON
COLUMBIA
CLATSOP
TILLAMOOK
WASHINGTON
MULTNOMAH
HOOD RIVER
SHERMAN
GILLIAM
MORROW
UMATILLA
WALLOWA
UNION
BAKER
GRANT
YAMHILL
CLACKAMAS
WASCO
POLK
MARION
WHEELER
JEFFERSON
LINCOLN
BENTON
LINN
MALHEUR
CROOK
HARNEY
COOS
LANE
DESCHUTES
LAKE
DOUGLAS
CURRY
JOSEPHINE
JACKSON
KLAMATH
S-11
• AUTHORIZED DISPOSAL SITES

F. Disposal Facilities

There is a total of 231 authorized solid waste disposal sites within the state. The use of the word "authorized" denotes that the site operates with the sanction of some governmental agency; i.e., municipal, county, state or federal. By contrast, a total of 628 unauthorized sites were observed and/or recorded during the survey. An accurate estimate of unauthorized facilities would be 650 to 700 since it was virtually impossible to locate and observe all such sites. It would, thus, appear that there are 3 unauthorized disposal sites for every 1 authorized site within the state.

For the purposes of classification during the survey, the various methods of operation are defined as follows:

A Sanitary Landfill is the disposal of solid wastes by compacting and covering each operating day (24 hours or less).

A Landfill is the disposal of solid wastes by compacting and covering at specific intervals, but not each operating day (exceeding 24 hours).

An Open Dump is a disposal site at which wastes are deposited without compaction or cover.

An Incinerator is a device which is specifically engineered and designed to incinerate solid wastes (tee-pee and wigwam burners not included).

A Transfer Station is a unit or structure at which solid waste is moved from one storage unit or collection vehicle to another, or which is used as temporary storage for solid waste.

Composting is the process of bio-chemical degradation of organic waste under controlled conditions.

Limited Burning is the burning of brush and other combustible material in an area separated from the putrescible material.

TABLE IX

DISPOSAL FACILITIES

Type of Facility	Number of Facilities	Percentile
Sanitary landfill	11	4%
Landfill	73	32%
Open dump	146	64%
Incinerator	1	0%
Transfer station	0	0%
Composting	0	0%

LAND DISPOSAL SITES THAT BURN

Method of Operation	Total Sites	Sites That Burn	Percentile
Sanitary landfill	11	1*	9%
Landfill	73	31*	42%
Open dump	146	130	89%

*Limited burning
**One incinerator not included

As seen in TABLE IX, 64% of the total authorized disposal sites in Oregon are being operated as open dumps and only 36% of the sites are being operated as landfills or sanitary landfills. Seventy per cent, or 162, of the disposal sites still rely on open burning as a disposal or reduction method. It should be noted that the only incinerator surveyed was approximately 36 years old and receives very limited use and is incapable of meeting current air pollution emission standards. The state of Oregon, at the present time, is relying on land disposal facilities entirely for solid waste disposal. There are no solid waste transfer systems nor composting systems operating within the state.

TABLE X

OWNERSHIP OF SITES

Site Owner	Number of Facilities	Percentile
Municipal	58	25%
County	43	18%
State	6	3%
Federal	39	17%
Private	78	34%
Data not obtained	7	3%

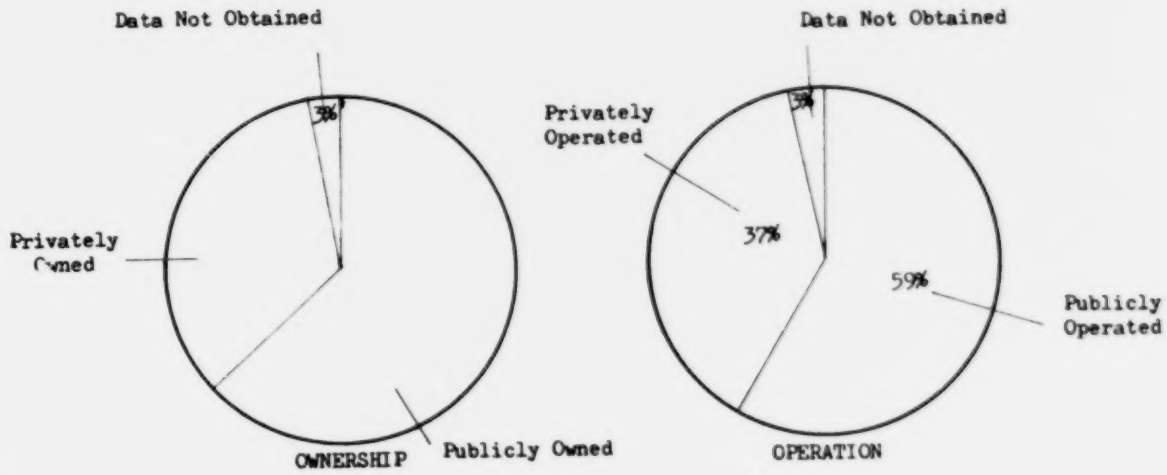
TABLE XI

OPERATORS OF SITES

Site Operator	Number of Facilities	Percentile
Municipal	42	18%
County	88	38%
State	4	2%
Federal	3	1%
Private	86	37%
Data not obtained	8	4%

GRAPH A

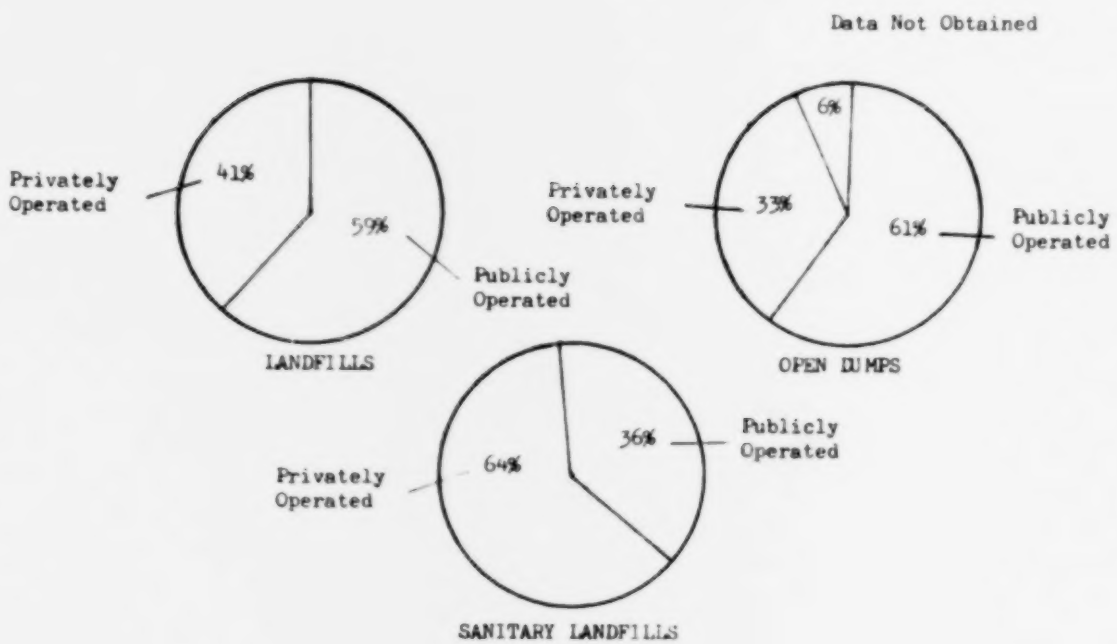
OWNERSHIP AND OPERATION OF SITES

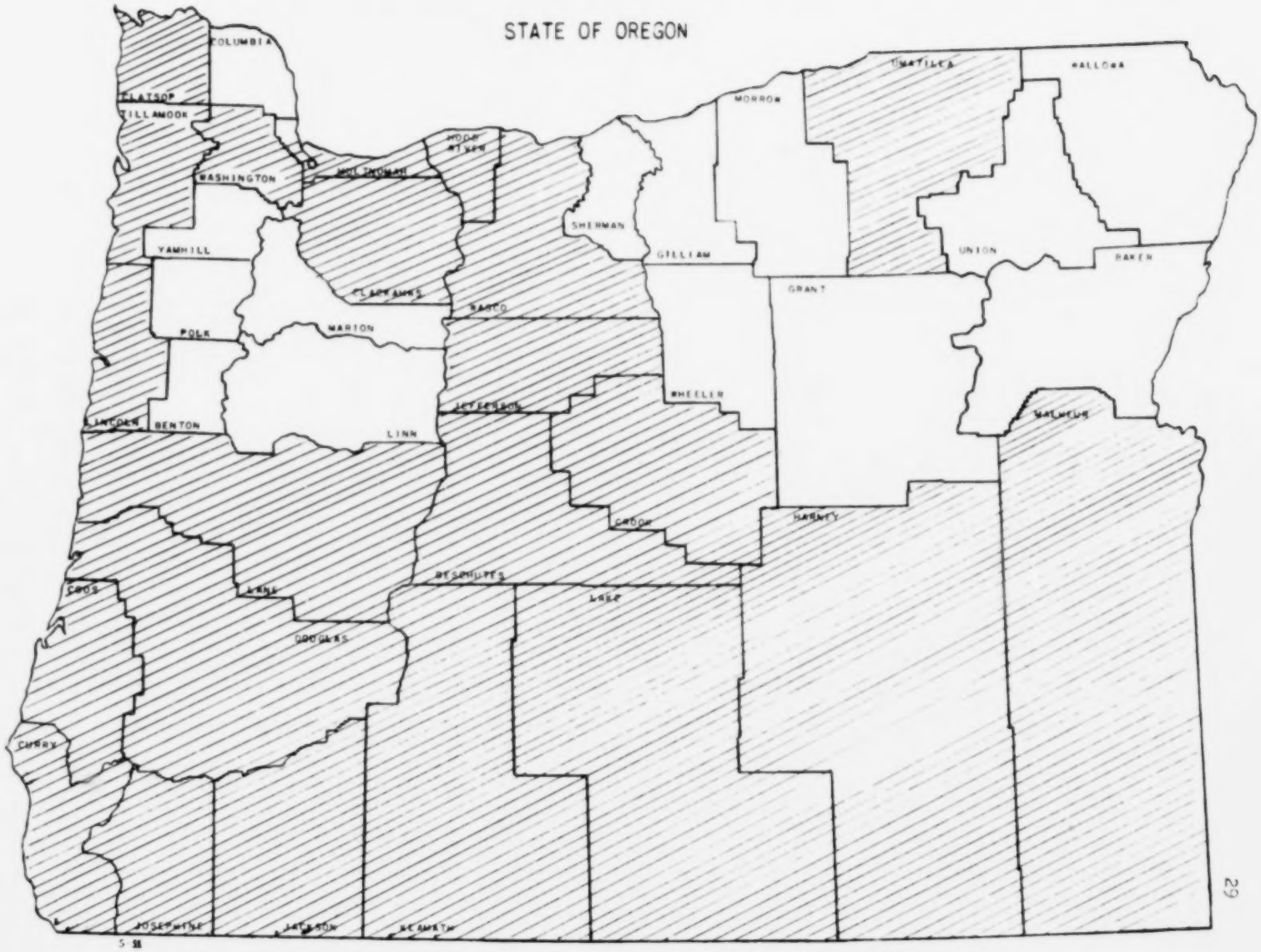


TABLES X and XI and the circle graphs show the 231 authorized sites categorized according to site owner and operator. As can be noted, 78 sites, or 34%, of the total authorized sites are under private ownership, while 126 sites, or 63%, are owned by various governmental agencies. In TABLE XI, 86, or 37%, of the total authorized sites are privately operated, and 137, or 59%, are operated by various levels of government. Of the 137 sites operated by government, 88, or 64%, are operated by counties and 42 sites, or 30%, were under municipal operation.

GRAPH B

OWNERSHIP - OPERATION RELATIONSHIP BY TYPE OF SITE





COUNTIES OPERATING ONE OR MORE DISPOSAL SITES

The circle graph, Plate A, comparing the ownership of the disposal site and type of operation shows that public agencies own and operate most of the sites in Oregon. Plate B relates public and private operation to the type of operation, and shows that the private interests operate comparatively more sanitary landfills and less landfills and dumps than do government or public interests.

TABLE XII

ANNUAL OPERATIONAL COST

Range - Dollars Per Year	Number of Facilities	Percentile
$ 14 - $ 500	34	15%
501 - 1,000	29	13%
1,001 - 2,000	14	6%
2,001 - 4,000	21	9%
4,001 - 8,000	35	15%
8,001 - 10,000	5	2%
10,001 - 20,000	11	5%
20,001 -	9	4%
Data not obtained	73	31%

TABLE XII shows a breakdown of the number of disposal sites and the annual operational costs. Data was not obtained on 73, or 31%, of the authorized sites, but it is estimated that most of these sites, if not all, would have an operational cost of $2,000 or less per year. Thus, 150, or 65%, of the total sites operate on $2,000 per year or less. One hundred seventy-one sites, or 74%, operation on $4,000 or less per year. The least amount recorded during the survey was $14 per year, while the largest was $247,000 per year. This graphically illustrates the vast cost differential of solid waste disposal sites within the state. Total cost of operation for the 155 authorized disposal sites for which data was obtained amounted to $1,584,000 per year. Twenty sites, or 9%, operated at an annual cost in excess of $10,000.

TABLE XIII

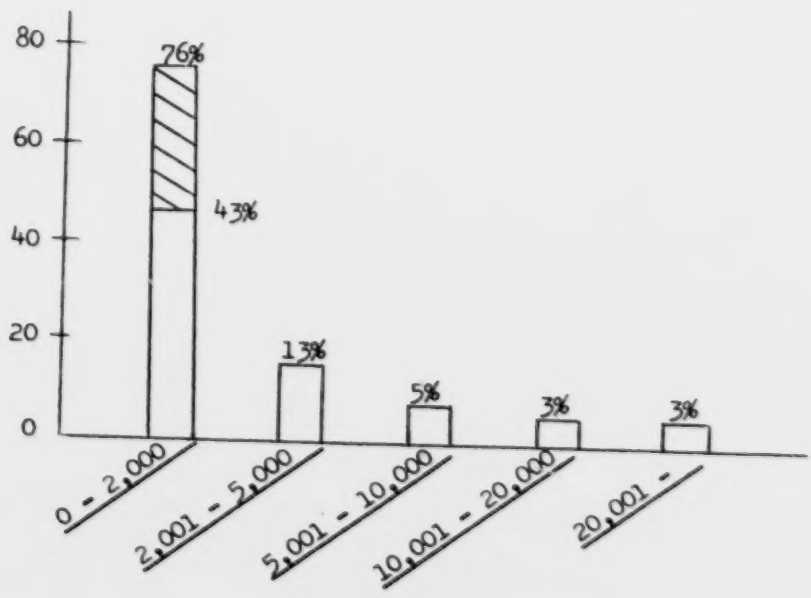
ESTIMATED VOLUME OF WASTE DEPOSITED - 1967

Range - Tons Per Year	Number of Facilities	Percentile
2 - 500	53	23%
501 - 1,000	24	10%
1,001 - 2,000	23	10%
2,001 - 5,000	30	13%
5,001 - 10,000	11	5%
10,001 - 20,000	7	3%
20,001 -	7	3%
Data not obtained	76	33%

TABLE XIII indicates the amounts of solid waste received by authorized sites during 1967. Data was obtained for 155 of the 231 disposal sites, or 67%. Total estimated tonnage for the 155 sites was 1,123,240 tons per year (7,285,000 cubic yards). The smallest amount received by an authorized facility was 2 tons per year, while the largest amount was 302,000 tons per year.

GRAPH C

TONS OF WASTE DEPOSITED - (1967) at authorized sites



GRAPH C shows the percentage of authorized disposal sites according to amounts (tons) of waste deposited annually (1967). The hash marks in the 0 - 2,000 column represent the number of sites (33%) for which data on disposal was not obtainable, and was estimated by survey personnel. This factual and estimated information shows that 176 sites, or 76%, accept 2,000 tons or less per year. Two hundred six, or 89%, accept 5,000 tons or less per year. Only 14 sites, or 6%, accept waste amounts in excess of 10,000 tons per year.

PLATE D

QUANTATIVE RECORDS MAINTAINED

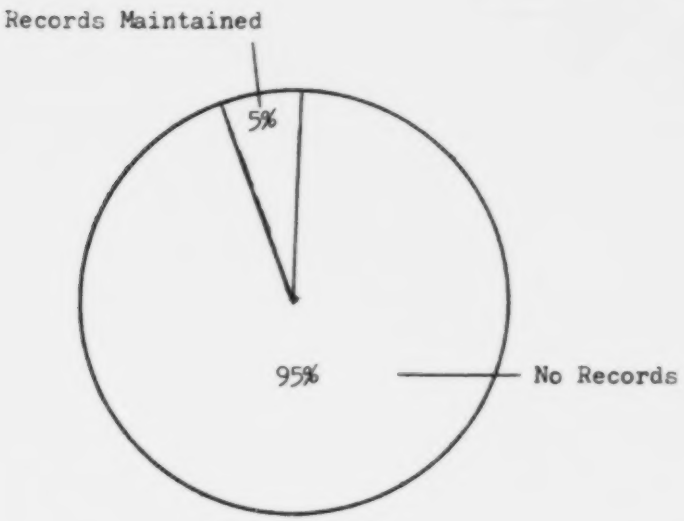


PLATE D gives the percentage of sites which are presently keeping records of waste amounts received. All sites surveyed which kept records did so on a volumetric basis. None of the sites in Oregon use weight scales for measurement of deposited wastes. Consequently, data on amounts received, costs of operation, number of loads or vehicles and other data is arrived at by estimation.

1. Site Operation

(a) Public Access - The survey revealed that 224 authorized disposal sites, or 97%, are open for use by the general public, while 7, or 3%, did not permit public access. A total of 162 sites, or 70% of all sites surveyed, were open to the public 7 days a week. A total of 24 sites, or 10%, were open 3 days a week or less with the remaining sites varying in between. Some sites were open only a few hours a day. The survey did not record the number of sites that charged for dumping.

A relationship between the amount of unauthorized dumping and the availability of an authorized site was noted during the survey. In areas where a site was open only a few hours each day or each week for use by the general public, the amount of unauthorized dumping was more prevalent. These unauthorized dumps were often located close to the authorized sites. The least amount of unauthorized dumping seemed to occur in areas where authorized sites are open for use the majority of the time and no direct fee is required for use of the facility.

(b) Loads Received by Types of Vehicles - Individual loads of solid waste are brought to the disposal sites in various types of vehicles. These vehicles are defined as follows: public collection vehicles refer to a variety of vehicles owned by public agencies which are used to transport solid waste; private collection vehicles refer to standard garbage vehicles such as packer trucks and open-bed trucks which are owned by private garbage collectors; and cars, pickups and trailers

refer to vehicles owned by individuals and used to transport solid waste occasionally.

TABLE XIV

LOADS OF SOLID WASTE PER WEEK

Transporting Vehicle	Loads	Percentile
Publicly-owned collection vehicles	574	2%
Privately-owned collection vehicles	5,355	15%
Cars, pickups, trailers, etc.	30,835	83%

As can be seen by the above table, a total of 36,764 vehicle loads of solid waste are being transported each week to the authorized sites in the state. No figure is available on the total number of loads being transported which end up at unauthorized dumps.

The weekly number of loads being transported by the general public in cars, pickups and trailers is almost 6 times greater than the number of loads transported by both publicly-owned and privately-owned collection vehicles. However, these loads from vehicles operated by the general public bring only 25% of the total volume of solid waste to the disposal sites, thus increasing the traffic problem at the site.

(c) Type of Surrounding Land Use - The land development of the area surrounding the sites surveyed is as follows:

TABLE XV

SURROUNDING LAND USE

Land Development	Percentile
Residential	2%
Commercial	1%
Industrial	3%
Agricultural	30%
Undeveloped	48%
Forest	15%

Since the majority of the authorized sites in Oregon practice open burning to some degree, it is understandable that only 6% of the total number of sites are located in residential, commercial or industrial areas. In comparison, it was found that 1 of the 11 sanitary landfill operations was located in either residential, commercial or industrial areas.

(d) Future Planning - Very few sites visited had a use planned for the completed site. In fact, 91% of all the total sites visited reported no planned use for the completed site.

Seven of the 11 sanitary landfills did report a planned use such as recreation, light construction or agriculture. Only 1% of the open-dump operations indicated any ultimate use of the completed site.

(e) Cover Material - Cover material in varying amounts is available at 75% or 173 sites surveyed, but only 35% or 82 sites were using cover material on a regularly-scheduled basis (at least annually). No provision for cover material is made at 148 sites.

(f) Compaction Equipment - The most widely used type of equipment for compaction and covering of solid waste is the crawler-type tractor. Although the use of specially designed steel wheel compactors is increasing at the large sanitary landfills, 95% of the sites that provide compaction still use crawler-type tractors. At many of the sites, the equipment used is quite outdated and in poor repair.

(g) Physical Characteristics - The physical characteristics of disposal sites varied as follows:

TABLE XVI

SITE LOCATIONS

Physical Feature	Percentile
Quarry or barrow pit	9%
Gully-ravine-canyon	33%
Level area	16%
Hillside	37%
Marsh-tidal-flood	5%

As can be seen in the above table, 70% of the disposal sites in Oregon are located in gully-canyon and hillside areas.

(h) General Character of Operation - The table "General Character of Operation" (TABLE XVII) reflects the over-all condition of each site actually observed at the time of the survey.

(i) Water Problems - The visible effects of solid waste on the waters of the state were tabulated (TABLE XVIII). Water can percolate through deposited wastes to create an effluent or leachate. In most cases, the occurrence of this leachate is detectable by accompanying odors and coloration of the effluent. Leachate may also be detectable by a chemical analysis if odors and coloration are not present. Since chemical analyses were not within the scope of the survey, visual observation constituted the basis for recording such conditions. Accordingly, where odor and coloration were observed, the term "leaching" was applied. Where surface water was observed to contact waste and did not give discoloration and odor, or where surface water was being diverted around the waste, the term "surface drainage problems" was applied. Of the total number of authorized sites in Oregon, 40% have

either potential or existing drainage problems.

TABLE XVII

GENERAL CHARACTER OF OPERATION

	Unsightly Appearance	Blowing Paper	Surface Drainage Problems	Leaching Drainage Problems	Rodent Control Needed	Fly Control Needed	Dust and Debris Control Needed	Odor Control Needed	Burning Noted
Sanitary Landfill	27%	27%	91%	9%	0%	18%	55%	0%	9%
Landfill (no burning)	48%	38%	55%	26%	29%	43%	45%	5%	17%
Landfill (burning)	87%	63%	13%	13%	26%	61%	55%	7%	94%
Open Dump (no burning)	94%	88%	25%	12%	25%	74%	88%	6%	19%
Open Dump (burning)	100%	67%	32%	2%	55%	84%	69%	15%	98%
Total For All Sites	85%	60%	30%	10%	41%	69%	63%	10%	73%

TABLE XVIII

DRAINAGE PROBLEMS

Type of Drainage Problem	Sites	Percentile
Surface drainage	70	30%
Leaching	22	10%
No problems	139	60%

(j) Vector Problems - The survey showed that 59% of the authorized facilities did not need rodent control, but it must be realized that domestic rodents (Rattus Norvegicus and Rattus Rattus) are not common to many parts of central and eastern Oregon. Disposal facilities in those areas were recorded as not needing rat control regardless of the disposal method used.

Fly problems were observed at 69% of the sites even though many of the sites could not be observed during periods conducive to fly production. Hornets and yellow jackets plagued some of the disposal sites during the summer months.

(k) Accidental Fire Protection - Since burning is practiced in some degree at 70% of the disposal sites, it is important to note the methods used for fire protection. No attempt was made to assess the adequacy of the method being used. Of importance is the fact that 103 sites, or 45% of the authorized disposal sites in the state, do not have a method of fire protection available on site. This is especially significant since 65% of the authorized sites are located in undeveloped or forested areas. The following table indicates the on-site method of fire protection used:

TABLE XIX

FIRE PROTECTION

Method Used	Number of Sites	Percentile
Water under pressure	49	21%
Firebreak	79	34%
No protection	103	45%

(l) Caretaker - The presence of an operator or caretaker at a site varies with the type of operation as follows:

TABLE XX

PERSON ON DUTY AT SITE

Type of Site	Per Cent Attended
Sanitary landfill	91%
Landfill	50%
Landfill (limited burning)	39%
Open dump (burning)	38%
Open dump (no burning)	13%
All sites	41%

Certain disposal sites in rural areas are maintained by transporting equipment from one site to another and these sites are attended only when the equipment operator is at the site.

(m) Salvaging - Salvaging is conducted in varying degrees at 91 sites, or 39% of the authorized disposal sites, but salvaging is permitted at 68% of the sites. The materials salvaged are generally stockpiled on site in a very disorderly manner.

The following table indicates that the practice of salvaging is quite consistent regardless of the method of operation.

TABLE XXI

SALVAGING PRACTICED

Type of Operation	Percentile
Sanitary landfill	36%
Landfill	38%
Open dump	49%
All Sites	39%

(n) Equipment Washing - Truck-washing facilities are available at only 11% of the 244 authorized disposal sites. Some of these facilities were inadequately-constructed and others were well-constructed with concrete aprons, proper waste

water disposal systems and water under pressure.

In some instances, mobile washing facilities are utilized. Counties that transport equipment to maintain landfills on a routine basis often mount a 500 to 1,000 gallon tank on a truck or trailer hauling the equipment. This tank is pressurized by a small gasoline pump or a hydraulic pump and contains water. This water may be used for washing equipment, for fire control or for a "carrier" of insecticide to control hornets or flies at disposal sites.

2. Special Waste Disposal

Transportation facilities, labor market and raw product availability dictate the location of industries. Though the survey is not complete on industrial wastes, information on certain problem wastes is available from various sources.

(a) Tires - Portland is a tire distribution center for a large section of the state, and the tire distributors return worn tires to Portland. Tires are not acceptable in volume at the Portland disposal sites and are stockpiled in about 3 locations in the Portland metropolitan area. It is estimated that at least 1 million tires are stockpiled at the present time. A major distributor in central Oregon is still able to burn discarded tires.

(b) Oil - Another special waste is oil. Waste oil accumulates from the following:

(1) Railroad car cleaning

(2) Tank truck cleaning

(3) Ship bunkers

(4) Fuel oil tank cleaning (homes, apartments, etc.)

(5) Automobile crank case oil

The volume of oil waste collected in the metropolitan area of Salem, Eugene and Portland ranges from 6-1/2 to 13 million gallons annually.

About 3 million gallons of oil are re-refined or cleaned for re-use and resale. Other waste oil is used for settling road dust, and a considerable amount is stored in tanks or pits. Between 3 to 6 million gallons of waste oil per year are not accounted for.

(c) Chemical Wastes - The increase in industrial plants in major population centers in Oregon has resulted in an increase in chemically-oriented manufacturing processes.

The chemical wastes from these processes are barrelled or stored in tank cars or in tank trucks. Some wastes are liquid, some are tarry compounds and some are slurrys mixed with lime or other sludges.

Volumes of production are not known specifically, but could vary from 2,500 gallons to more than 10,000 gallons per week per manufacturer.

(d) Cannery Wastes - Major food processing plants for fruits and vegetables are located in the Willamette Valley and eastern Oregon. Seafood processing plants are clustered along the coastal areas of Oregon. All food processing plants produce solid wastes in volume.

Oregon State University, Department of Food Science and Technology, has embarked on a survey of procedures in wastes

handling for fruit and vegetable processors.

Data is not complete, but some estimates of volumes are available. Each processor of corn may produce from 25,000 to 50,000 tons of waste per year depending on season and method of processing. This corn waste is sold as cattle feed.

Bean waste varies from 15,000 to 32,000 tons per year for each processor and only a portion of this waste is fed to animals. Approximately 20 to 30 truckloads of bean waste are received daily at the Salem landfill during the canning season. Pear, apple and other fruit wastes present a similar problem and are not fed to cattle for various reasons. Medford and Hood River, as well as Salem, have fruit wastes.

Brussels sprout, broccoli, cabbage and onion wastes are eaten only by sheep and pigs and limited flocks or herds of these animals limits the volume that can be disposed of in this manner.

With the exception of corn, therefore, most cannery wastes, including the sludge from waste-water filter plants at the cannery, are handled by land disposal methods.

The seafood industry produces shell and fish wastes that are presently returned to the coastal waters for disposal or are processed for mink food, fish meal, fish food oil or protein concentrate.

Pounds of Solid Fish Waste
Produced on Oregon Coast - 1968

Coho Salmon	1,650,000
Tuna	23,000,000
Shrimp	8,400,000
Crab	7,500,000
Miscellaneous Fish	6,300,000

Total fish waste - 46,850,000 pounds, or 23,000 tons (based on total catch for 1968).

There is 1 fish waste rendering plant (at Warrenton). The rendering industry and the use of waste for mink food accounts for about 60% to 70% of the total waste. The remaining 30% to 40% is discharged to the coastal waters. Land disposal of fish waste has been tried, but it creates odor and fly problems. The demand for fish waste as a fertilizer or cattle feed is minimal.

(e) Demolition and Construction Waste - Demolition and construction waste is the waste (building material and rubble) from the construction, remodeling, repair and demolition of buildings or other structures. Direct factors affecting the volume of demolition waste are the size of the community and the amount of urban renewal being conducted.

At present, demolition waste is not burned on site in the Portland metropolitan area nor in Salem or Eugene. Special disposal sites are maintained for this rubble, but an estimate of total volume or tonnage deposited was not possible because of lack of records and varying sizes of transporting vehicles. However, one demolition site in Portland area indicated that they accepted about 15,600 loads in 1967.

(f) Automobile Bodies - Automobile bodies are accepted at 144 sites, or 62% of the total sites. They are then handled in a variety of ways. At a few of the sites, car bodies are compacted and buried with other solid waste. At other sites, the car bodies are burned and then compacted and stockpiled for transport to a scrap dealer. At other sites, a separate storage area for car bodies is provided. A contractor with a portable compactor will remove these stored bodies periodically for salvage rights; two operate in Oregon. At still other sites, car bodies accumulate without a plan for disposal or salvage.

Data from a 1965 report of the Bureau of Mines for a five-county area (Polk, Yamhill, Marion, Clackamas and Washington) reported 16,700 abandoned vehicles in a 5,224 square mile area, or 3.1 vehicles abandoned per square mile. There were 1,311,626 motor vehicles registered in Oregon in 1967, and in that same year, 51,056 motor vehicle registrations were voided. On this basis, one vehicle for every 40 persons in Oregon became obsolete during that year.

(g) Dead Animals - The method of disposal of dead animals varies throughout the state. In certain areas, dead animals are collected by rendering plants for processing. Where this service is not available, individuals have to either dispose of dead animals on their own property or haul them to a disposal site.

When conditions do not permit an individual to dispose of a dead animal on his own property and the authorized sites in

the area do not accept them, illegal dumping occurs. The following table indicates the percentage of authorized sites that handle dead animals:

TABLE XXII

PERCENTAGE OF SITES ACCEPTING DEAD ANIMALS

	Sanitary Landfills	Landfills	Open Dumps
Large animals only	0%	1%	0%
Small animals only	18%	11%	4%
All animals	27%	41%	58%
No animals	55%	47%	38%

As indicated, 42% of the total sites do not accept dead animals. The sanitary landfill method of operation can adequately handle dead animals, but only 3 of the sanitary landfills in the state will accept them.

IV. PROBLEMS AND NEEDS

A. General Information

From evaluation of the data collected, several problems in solid waste management (storage, collection transportation and collection) became evident. Also, deductions from the data showed that "Financing and Manpower" for operation and surveillance were evident needs not recorded directly in the survey data.

From these evaluations, the State Plan and Program will be developed.

B. Storage

Problems of storage of solid waste reflect the social and economic status of the individual or the industry, the physical location of the premise, the technicalities of handling solid waste and the efforts of the political-legal jurisdiction to contend with the issues.

It appears from the survey that there was a lack of "rules and regulations" or "ordinances" and a lack of priority for enforcement of rules and regulations by local, county or city agencies.

Prior to the adoption of the State Rules and Regulations in February, 1969, the few standards for storage of solid waste were in city ordinances, and there were none for rural areas.

Some specific needs appear as follows:

1. Rules and regulations were not specific for solid waste. Only 19% of those ordinances checked specified control of garbage, rubbish and demolition wastes, and none specified car bodies. Some ordinances could be used to control rubbish, garbage and car bodies, but were written in contexts other than "Solid Waste Control". Only one county had a county ordinance and this was adopted recently.

2. Enforcement of ordinances was inadequate because of lack of enforcement personnel or because work load priorities placed enforcement of solid waste storage problems low in the order of priority.
3. Penalties assessed by ordinances were primarily fines. Suggestions or guides for "corrective" action to be used by the courts were lacking.
4. Public apathy is evidenced by the number of premises with derelict cars, weeds and brush, old lumber, appliances and garbage found throughout the state.

   This public apathy is related to the economics of the individual or neighborhood (welfare or low income), social outlook (lack of pride in premise or neighborhood), physical surroundings (industrial areas, or areas plagued with other environmental problems, such as air or water pollution) and the lack of a collection service that picked up all types of solid waste. This refusal of service was caused by lack of preparation of the waste by the individual or by restrictions imposed at the disposal site.
5. Use of burning barrels or other devices was prevalent throughout the state. The only controls on burning (in 52, or 43%, of the communities) were related to fire control.

   Use of these burning barrels create odors, fly problems, rodent attraction and fire problems on site or in collection trucks.

   Evident reasons for burning on the private premise were:

   (a) Reduction of size of waste or volume (high percentage of combustibles).

   (b) Large lots provided space and opportunity for burning.

(c) Economic savings resulting from fewer cans of waste to be removed.

(d) Personal habits or practices including the "right to burn".

6. Wrapping of garbage is not enforced in Oregon. This requirement appeared in some city ordinances, but is not enforced. Wrapping would extend the life and condition of the garbage can and reduce insect and animal attractants.

7. Commercial establishments using "containers" or "drop boxes" of one or more cubic yards were found in 28% of the towns. This service is on the increase because it results in fewer containers to maintain, less storage space used for containers and a reduction in manpower needed by collectors.

However, these large containers were hard to clean, tops of the containers were not tight or easily handled and the responsibility for cleaning and maintaining the containers is usually not spelled out by ordinance or contract.

The need for improvement in storage appears to be through more effective and better enforced ordinances. These ordinances could be based on the recent "littering" laws of the state.

C. Collection

As in storage, the socio-economic status of the individual or business dictates the method of collection (or removal from the premise) of solid waste.

The survey indicated that 85% of the urban population had collection service, that 106 small communities do not have collection services and that unauthorized dumps exceed authorized dumps in a ratio of at least 3 to 1. The causes of inadequate collection could be low income,

low social status, physical location of properties and the lack of effective political-legal controls.

The majority of the trucks used in collecting solid waste were well constructed. Those open trucks in service were used primarily for hauling solid waste such as brush and large debris. Frequency of collection was weekly or more often.

Of special note was the fact that some wastes, such as dead animals, large brush and other debris, were not hauled regularly, and in some cases, not at all. It was also evident that wastes hauled by regular collectors did not represent the total volume of waste produced in the area served. It is estimated that at least 25% of the waste produced was hauled by the private citizen or by services other than the regular collector.

Franchises for collectors were not written to protect the community by making provision for services when the collector failed to perform such service. There were no franchised services in county areas.

A need in collection is to increase the service area, to provide better service in collecting special wastes, to improve construction of some trucks and to provide better franchise wording for collection control. Such wording is being developed under the 1969 state law providing county franchise rights.

D. Long-Distance Hauling

Although this part of solid waste management has not been developed in Oregon, studies and efforts to improve disposal, collection and storage point to the eventual need of transfer stations and long-distance hauls for solid waste disposal.

A need is to evaluate the economics of long-distance hauls and com-

pare costs to land acquisition and disposal costs in areas closer to the community served.

E. Disposal

The large number of "open-burning dumps" and the large number of unauthorized disposal sites compared to the relatively few "sanitary landfills" or other acceptable methods of disposal emphasized the problem of solid waste disposal during the survey.

Poor record keeping by disposal site operators made it impossible to record the amounts or types of waste being received, and data was estimated from verbal comment. Information gathered, but not documented in the survey, pointed out that industrial waste is finding its way to public disposal sites in greater amounts. These increasing amounts of industrial waste being disposed of on land result from improved controls of air pollution and water pollution.

Oregon depends on land disposal for almost all of its solid waste. "Open-burning" occurs in every county in the state (162 of 231 sites). Because of the past availability of land, solid waste disposal sites have been located in undeveloped areas where little use was made of the land (land-use around 93% of the sites was forest land, agricultural land or undeveloped land). Because of the undeveloped character of the lands, the disposal sites were considered "out of sight -- out of mind" and little concern was given to methods of operation of the sites. Burning created rodent and insect problems, was a safety hazard and detracted esthetically from the use of surrounding land.

The open dumps have operated on a "salvage rights" basis to partially cover the cost of operating the sites. Salvage fees and "gate fees" paid the salary of the dump caretaker who was just a traffic director

in a large number of sites. Storage of salvage or failure to remove salvage created a safety hazard and rodent and insect problem.

Rodent and insect problems were noted in a number of counties. However, domestic rodents are not found in Baker, Grant, Wallowa, Lake, Crook and Deschutes Counties. However, because of the operation of disposal sites, rats can move into these areas as they have done in Union and Malheur Counties within the past 15 years. Skunks have been a problem in Wallowa County disposal sites.

Unauthorized dumps were less frequent in areas where a "gate charge" was not made for use of the dump. The large number of unauthorized dumps (640) may be attributed to the reluctance of people to pay for disposal of a waste, the lack of a collection service to pick up certain wastes (or special pickup at high cost), a lack of an authorized method of disposal within a reasonable distance especially in sparsely-settled areas, or, just a feeling of the "personal right to throw a waste away".

Within the past 10 years, public interest has been increasingly aroused about "pollution" problems and a concern about open-burning dumps. The sanitary landfill has been recommended in Oregon because it appears to be feasible because there is still land to use and is more economical than incineration or composting, the only other practiced methods of waste reduction. This has led to the development of 11 sanitary landfills in the state. However, the high rainfall, soil characteristics and terrain of the western slopes of the Cascades and coastal areas have led to a "leachate problem". Preliminary planning and better site selection could perhaps have reduced the leachate problem.

Needs for disposal are: development of more sanitary landfills and the elimination of open dumps; reduction of the number of disposal sites through regional approaches; provision of disposal methods or disposal sites that are convenient in hours of operation and location for public use; exploration of better methods of reduction and handling of solid waste (such as re-use, recycling or special techniques of handling specific industrial wastes); better operation of disposal sites for vector control, safety control and control of public health problems; and the development of methods of controlling leachate through better disposal site operation and planning.

F. Financing and Manpower

Throughout the survey, financing and economic conditions were noted to affect solid waste management though this could not be easily documented.

It was determined that there is some cost to every portion of solid waste management. Proportionately more is paid for collection ($21 to $24 per can per year) than for disposal (less than $1 per person per year), and collection services, where available, were proportionately the better operated part of solid waste management.

Financing of solid waste disposal is now paid by private enterprise, by tax funds or by a combination of both. Private enterprise finances disposal out of collection receipts. The most commonly used are revenues from property taxes. These sources of finance do not prorate costs equally to user's needs and are not sufficient to support food operations.

Improvement of solid waste management is dependent on manpower for education and enforcement. The county sanitarians (120 persons) have

carried the program for the past 20 years with inadequate laws. They work with the private citizen, the small business, local industry and all governmental levels to improve storage, transportation, collection and disposal.

Needs in financing are to develop a more equitable means of distributing costs of solid waste management. Needs in manpower are to retain the county sanitarian or a similar work force in enforcement and education to augment the relatively inadequate manpower allocation by the state.

STATE PLAN

V. RECOMMENDATIONS FOR SOLUTIONS

A. General Recommendations

From the analysis of the survey data, problems and needs, certain general statements and recommendations are evident.

Because the Willamette Valley has the heaviest population concentration, the greatest industrial development, the heaviest agricultural production and the heaviest traffic conditions, the problems of solid waste management are greatest in this area. Future development of all the factors mentioned above has the greatest potential for the Willamette Valley. Solid waste management problems will increase in this part of Oregon at a faster ratio than the socio-economic developments.

The following recommendations are general and will apply to solid waste management throughout the state:

1. Solid waste management must include storage, collection, transportation and disposal as a tightly inter-related package.
2. Solid waste management must be considered as a <u>public service utility</u> and as necessary for the welfare of man as is water and sewage management.
3. Financing of solid waste management is crucial and must be provided on an equitable basis:

   Financing plans should include:

   (a) Income from one or more of the following:

      (1) Fees for collection services

      (2) User's fees collected at disposal sites

      (3) Governmental subsidy - by county, state or federal units

      (4) Financing through a sanitary district or by contractual

agreement with a private franchise operator in a designated area.

(b) Costs of all the following:

(1) Initial land acquisition and future land acquisitions

(2) Facility construction and maintenance

(3) Equipment acquisition, maintenance and replacement

(4) Manpower for operation

(5) Exploration of new and improved methods of handling and disposing waste.

4. Planning and agreements between cities, between cities and counties and, perhaps, between states are necessary. Solid waste moves across city, county and state lines for disposal purposes.

5. County governments must become more actively engaged in solid waste management. Most disposal sites are located outside of cities, bringing disposal of urban waste as well as rural and suburban waste into county responsibility.

County government activity is most effective through county-wide planning for solid waste management and use of county planning resources (see Addendum A and Addendum B).

6. More accurate information as to type and volume of waste is needed. This can be readily obtained by disposal site operators through better records.

7. Manpower for enforcement of rules and regulations should remain at the county level because state laws, county ordinances and city ordinances may be better correlated to the needs of the people at the local level.

8. Correlation of enforcement must continue through the county health

department, the State Board of Health, the Environmental Quality Commission and the State Department of Agriculture until such time that state laws centralize these responsibilities.

9. Planning and zoning commissions must recognize the necessity of providing sites for disposal facilities for established and new population centers and industrial developments, and aid in proper zoning for disposal sites.

B. Recommended Solutions for Storage

The observed practices of piling refuse on private lots and hauling refuse in private vehicles gives evidence that better storage and collection must be provided.

1. Rules and Regulations promulgated in February, 1969, by the State Board of Health, Section 38-020, and referring to storage units and collection frequency are to be enforced by city and county authorities alike. Necessary educational material is to be distributed by the counties to individuals and industries.
2. Under SB 302, 1969 Legislature, counties may now franchise collectors to serve the county and these franchises should correlate with the city franchise systems current in 72% of the cities.
3. New methods of volume reduction to improve storage of solid waste shall incorporate air pollution and water protection controls.
4. Local laws or ordinances should be developed through which costs of waste removal could be assessed directly to the property on which good practices of storage or removal of solid waste are persistently ignored.
5. Drop box service for storage-collection of waste may have to be a county function to give service to recreational and rural areas.

6. Methods of pre-preparation of industrial wastes (such as grinding, pressing or catalyzing) may be required as part of on-site storage or collection responsibilities of the producing industry when these wastes are to be moved to public disposal sites or to disposal sites operated by private enterprise.

7. On-site storage of industrial-agricultural wastes must be placed at a distance from streams and residences adequate to reduce air and water pollution, or other suppressive methods should be practiced.

C. Recommended Solutions for Collection and Transportation

Collection of solid waste is now provided primarily by private collectors.

1. Section 28-025 of the State Rules adopted in February, 1969, apply and are to be enforced (see Addendum D).

2. Exploration of the use of transfer stations in metropolitan areas is highly recommended and should be explored on a city-county basis. Drop-box service in rural areas will provide a similar service. These services will reduce traffic problems and operation costs at disposal sites.

3. Industrial waste transportation may present specific problems for a particular waste. Consideration and control shall be cleared with the Public Utilities Commission, the Department of Agriculture and the State Highway Department. At least one company now provides disposal service for nuclear wastes and hazardous chemicals to industries in Oregon.

D. Recommended Solutions for Disposal

Disposal practices for solid waste are very dependent on population

served, industrial development of the area, economics of the area and physiographic nature of the particular area.

1. The basic method of disposal for all solid wastes recommended in Oregon at this time is burial by landfill or sanitary landfill. Other methods may be developed and necessary at a later date.
   (a) For incorporated communities of less than 5,000 population, the disposal site may be operated as a landfill with periodic cover if the location, geological conditions and types of waste are such that a public health hazard will not be created. In some cases, efforts of smaller communities to maintain landfills may have to be augmented by consolidation of a number of small communities or by aid from county government. Every effort should be made to operate sanitary landfills.
   (b) For communities larger than 5,000 population, the sanitary landfill with daily cover is to be the practice unless other approved methods of waste disposal are developed. Thirty-six cities, or 14% of the incorporated communities and 75% of the urban population, will be served by a sanitary landfill or other approved method.
   (c) Preliminary planning of operation, equipment needs and site acquisition is mandatory because of changing land values and land use.
2. Special recommendations for landfill operations are necessary in the Willamette Valley-coastal area because the heavy rainfall and tight soil create some seasonal operation problems. In site selection in this area, therefore, these special considerations should be evaluated:

(a) Soil conditions, giving priority to gravelly sands;

(b) Documentation of ground water table elevation and fluctuation;

(c) Diversion or special drainage for surface run-off away from the operational site;

(d) Holding ponds, storage areas or waste water treatment devices for possible use to handle water that cannot be diverted.

3. The number of unauthorized disposal sites shall be reduced. Because unauthorized sites are located in the counties, counties can alleviate the problem by: cleaning up such areas by burying or removing the debris; posting "No Dumping" signs at various sites; and providing and maintaining convenient disposal sites, drop-box service or other methods of collection and disposal. (This may be done as provided by ORS 459.080 and ORS 433.720 and ORS 451.570).

4. Cooperative agreements for operation of disposal sites must be made between cities and counties in which counties would take an active and financial part. Possible cooperative agreements for disposal site use between cities and counties are suggested in the addendum.

5. Wastes of special nature and volume need separate consideration:

(a) Automobile hulks

(1) Compress and store for shipment to metal salvage units

or

(2) Include in landfill operation

or

(3) Bury as fill-in land reclamation.

(b) Demolition waste

Bury in landfills where burning is prohibited.

(c) Tire wastes

Prepare for salvage or disposal in landfill by grinding.

(d) Sewage sludge

(1) Dispose on land by plowing or disking

(2) Store in a lagoon

or

(3) Dispose in a landfill if dried waste.

Septic tank sludge should be introduced into a municipal sewage treatment device where possible.

All the above are to be with the permission of the local health officer.

(e) Oil or chemical waste

The Department of Agriculture through HB 1335 (Oregon Legislature, 1969) controls disposal of pesticides.

Oils and other chemical waste disposal demand special handling and plans should be correlated with the Department of Environmental Quality.

(f) Industrial waste (when not handled as raw material for other processing or not disposed of on the industrial plant site) is to be processed in a manner that would make it acceptable at the public site for disposal. This can include grinding, pressing, baling, mixing with other less troublesome materials or chemical detoxification.

6. Land acquisition for disposal is a major problem because land zoning, increased demand for land for other purposes and the general disfavor shown waste disposal operators.

At present, as shown by the survey, 63% of the sites are owned by

a governmental body and 59% are operated by government.

Long-range planning for site location and site acquisition may have to become more of a government function than presently.

VI. IMPLEMENTATION OF THE PLAN

Implementation of the state-wide plan will be discussed as "Immediate Objectives", "Intermediate Objectives" and "Long-Range Goals".

A. Immediate Objectives

During the survey, continuous field work and support was given in cooperation with county health departments. This will continue in the following ways:

1. Give consultation to operators of solid waste systems, individual collectors and city and county governments in waste management, collection, transportation and disposal.
2. Evaluate site operation and site selection. (See attached inspection forms proposed.)
3. Conduct state-wide training programs
   (a) Continue to give, on a quarterly basis, one or two day disposal site operators' conferences in various regions in the state;
   (b) Continue public meetings for orientation and instruction;
   (c) Continue training of state and county enforcement personnel and industrial waste management consultants.
4. Coordinate with related agencies and activities such as regional and state air pollution control, Environmental Quality Control Commission, State Engineer, State Department of Agriculture, the State Geologist and various federal agencies.
5. Continue to encourage new and improved technology by "grant request" or technical support of new approaches.
6. Develop educational material for public distribution.
7. Continue to up-date the state plan.

B. Intermediate Objectives - 5 to 10 years

Some objectives are dependent on research, legislation and manpower capabilities. These are the Intermediate Objectives:

1. Promote the concept that solid waste management is a "Materials Handling" problem.
2. Promote the concept that solid waste management is a necessity to the welfare of man and may be better solved if organized as a "Service Utility" either publicly or privately financed.
3. Explore other methods of solid waste reduction, salvage or disposal by interested industry, educational institutions and government in new approaches.
4. Increase the number of sanitary landfills in the state from 11 to 50.
5. Reduce the number of unauthorized dumps (to less than 200).
6. Suggest state legislation improvements as follows:
   (a) Because of necessary involvement of county sanitation personnel and liaison necessary, the Solid Waste Section on state level shall be placed in <u>one agency</u>.
   (b) State laws should have injunctive powers or clauses directing the clean-up or correction of the problem to give guidance to the judiciary.
   (c) A number of agencies are involved in waste disposal, including the State Department of Agriculture. Laws covering "waste disposal" should all be placed in one controlling agency.
   (d) Planning and zoning laws should be modified to include solid waste disposal areas in a category other than in "Special Use" permits.

C. Long-Range Goals - 20 Years

The development of better incinerators for volume reduction of combustible materials and the re-use, refabrication or recycling of materials should progress to the point that the discardable volume to be placed in sanitary landfills will remain equal to the present volume or reduced by about 20%.

Such progress will not materially affect the disposal and handling problems of smaller communities or the rural areas.

Long-distance hauling of the residue by pipeline or other method of transportation to centralized state-controlled disposal facilities may be a necessity to give best use of land.

Ocean disposal should <u>not</u> be considered unless improved technology would make the waste more adaptable to deep ocean disposal.

ADDENDUM A

SUGGESTED SOLID WASTE MANAGEMENT REGIONS

Because Solid Waste Management in Oregon involves residents of rural, sub-urban and urban areas, a rational approach to solutions should not be limited by city, county or even state boundaries or jurisdictions.

As a result of the survey, the following suggested groupings appear, at the present, to be logical geographical, economic and jurisdictional groupings to improve solid waste handling. County government should be involved in the operation and management of every site located outside a city boundary.

These are <u>suggestions</u> only and <u>local groups</u> or governments will necessarily have to study further development and implementation of planned management.

County participation should include one or more of the following:

A. Financial help

B. Site preparation and maintenance

C. County-wide planning through a coordinating committee to keep the number of disposal sites at a minimum and to help plan industrial and farm waste disposal.

D. Eliminate the known unauthorized dumps which the survey found in the following numbers:

Baker County	- 9	Jefferson County	- 13
Benton County	- 11	Josephine County	- 11
Clackamas County	- 43	Klamath County	- 10
Clatsop County	- 21	Lake County	- 2
Columbia County	- 41	Lane County	- 4
Coos County	- 46	Lincoln County	- 44
Crook County	- 11	Linn County	- 25
Curry County	- 47	Malheur County	- 8
Deschutes County	- 28	Marion County	- 15
Douglas County	- 52	Morrow County	- 7
Gilliam County	- 4	Multnomah County	- 47
Grant County	- 0	Polk County	- 4
Harney County	- 5	Sherman County	- 2
Hood River County	- 4	Tillamook County	- 17
Jackson County	- 15	Umatilla County	- 6

Union County	- 1	Washington County	- 52
Wallowa County	- 5	Wheeler County	- 6
Wasco County	- 0	Yamhill County	- 12

The following groupings are arranged by counties as they are located in the state. The sites are numbered on the maps by "Site Code Number" which can be related back to the name of the site in that county.

County & County Code	Name of Site	Site Code	Owned By	Operated By	Operation	Population Served
Clatsop (29)	Astoria	01	Public	Public	Landfill	11,500
	Warrenton	02	Public	Public	Open Dump	2,000
	Elsie	71	Public	Public	Open Dump	500
	Seaside	51	Private	Private	Open Dump	5,000
	Cannon Beach	61	Private	Private	Open Dump	1,500
	Koski	31	Private	Private	Open Dump	150
	Bill Mays	62	Private	Private	Open Dump	25
Tillamook (04)	Manzanita	11	Public	Public	Open Dump	1,200
	Pacific City	51	Public	Public	Open Dump	2,000
	Tillamook	31	Public	Public	Open Dump	10,000
	Bay City	21	Public	Private	Open Dump	3,200

Suggested Disposal Site Usage:

A. Tillamook County - Tillamook City, Bay City
B. Tillamook County - Cascade Head, etc.
C. Tillamook County - Nehalem, Manzanita, etc.

New Sites
02
Astoria
01
31
CLATSOP
51
61
62
71
11
COUNTY SEATS
TILLAMOOK
21
Tillamook
31
51
LOCATION IN STATE

County & County Code	Name of Site	Site Code	Owned By	Operated By	Operation	Population Served
Columbia (05)	Mickey	53	Private	Private	Open Dump	400
	Vernonia	61	Public	Private	Open Dump	1,500
	Sattler	81	Private	Private	Sanitary Landfill	2,000
	Rainier	11	Public	Private	Open Dump	3,500
	Sasia	51	Private	Private	Open Dump	10,000
	Clatskanie	31	Public	Private	Open Dump	1,500
Washington (34)	Shady Brook	11	Public	Public	Landfill	66,000
	Franks	33	Private	Private	Landfill	13,500
Multnomah (26)	Multnomah County	18	Public	Public	Sanitary Landfill	50,000
	Hawk's	16	Private	Private	Open Dump	Demolition
	Waybo	12	Private	Private	Landfill	Demolition
	City of Portland	17	Public	Public	Open Dump	475,000
	Plews	10	Private	Private	Open Dump	Demolition
	Portland Incinerator	13	Public	Public	Incinerator	Paper Only
Clackamas (03)	J & W	31	Private	Private	Landfill	Demolition
	Rossman	81	Private	Private	Sanitary Landfill	65,000
	Oregon City	82	Private	Private	Open Dump	10,000
	Sandy	12	Public	Public	Open Dump	4,000
	Brightwood	11	Public	Public	Open Dump	1,000

Suggested Disposal Site Usage:

A. Develop a regional site or regional sites with transfer stations for intermediate hauls to be used by -

Columbia County - St. Helens, Scappoose, Rainier
Washington County - Beaverton, Tigard, Hillsboro
Multnomah County - Portland, Gresham, etc.
Clackamas County - northern portion to include Brightwood and Estacada

B. Columbia County - Vernonia site

C. Clackamas County - southern (Woodburn and Canby to be included in Marion County management area)

D. Demolition materials sites may be located at various spots to accommodate large amounts of debris and materials shall be limited to demolition debris.

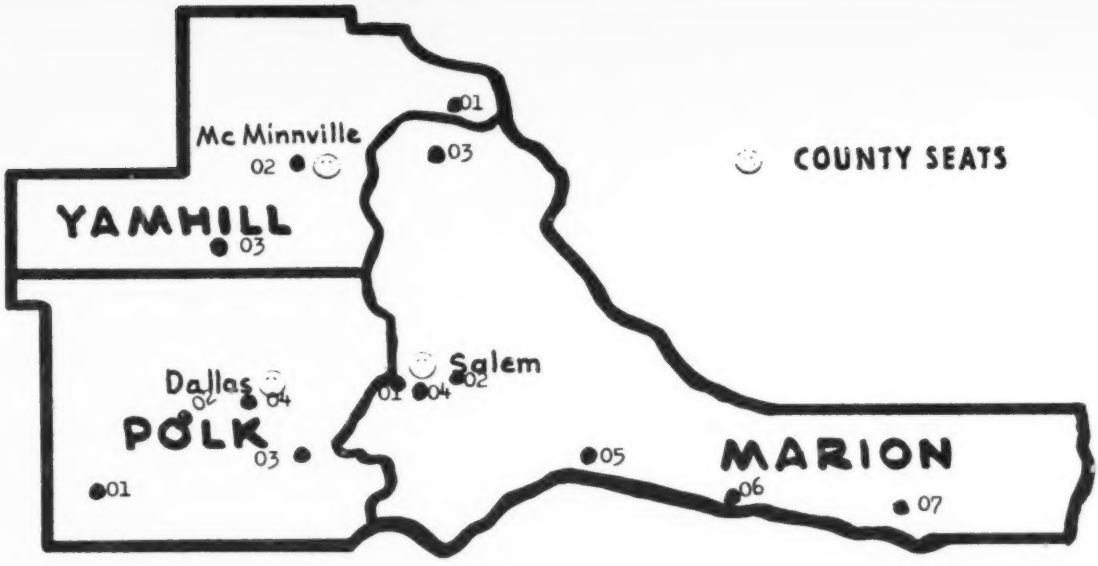
31
11
COLUMBIA
52
51
St. Helens
61
81
16
11
17
13
20
12
Hillsboro
WASHINGTON
Portland
18
MULTNOMAH
31
81
12
33
82
Oregon City
11
CLACKAMAS
COUNTY SEATS
LOCATION IN STATE

County & County Code	Name of Site	Site Code	Owned By	Operated By	Operation	Population Served
Yamhill (36)	Newburg	01	Private	Private	Landfill	7,000
	McMinnville	02	Private	Private	Landfill	12,000
	Sheridan	03	Private	Private	Landfill	3,500
Polk (27)	Valsetz	01	Private	Private	Open Dump	200
	Falls City	02	Public	Public	Open Dump	1,000
	Monmouth	03	Private	Private	Landfill	10,000
	Dallas	04	Private	Private	Landfill	10,000
Marion	Brown's Island	01	Private	Private	Sanitary Landfill	70,000
	McClay	02	Public	Private	Sanitary Landfill	21,000
	Woodburn	03	Public	Private	Landfill	13,300
	Airport	04	Public	Public	Landfill	Demolition
	Fern Ridge	05	Private	Private	Landfill	9,000
	Mill City	06	Public	Private	Landfill	1,600
	Idanha	07	Private	Private	Open Dump	600

Suggested Disposal Site Usage:

A. Marion County-Polk County - Dallas, Monmouth, Falls City, Salem
B. Marion County - Mill City, Idanha, Fern Ridge, Stayton
C. Marion County-Clackamas County - Woodburn, Canby
D. Yamhill County - Newberg, McMinnville, Sheridan

It may be possible to combine most of the Marion-Yamhill-Polk County service into one or two large site operations.

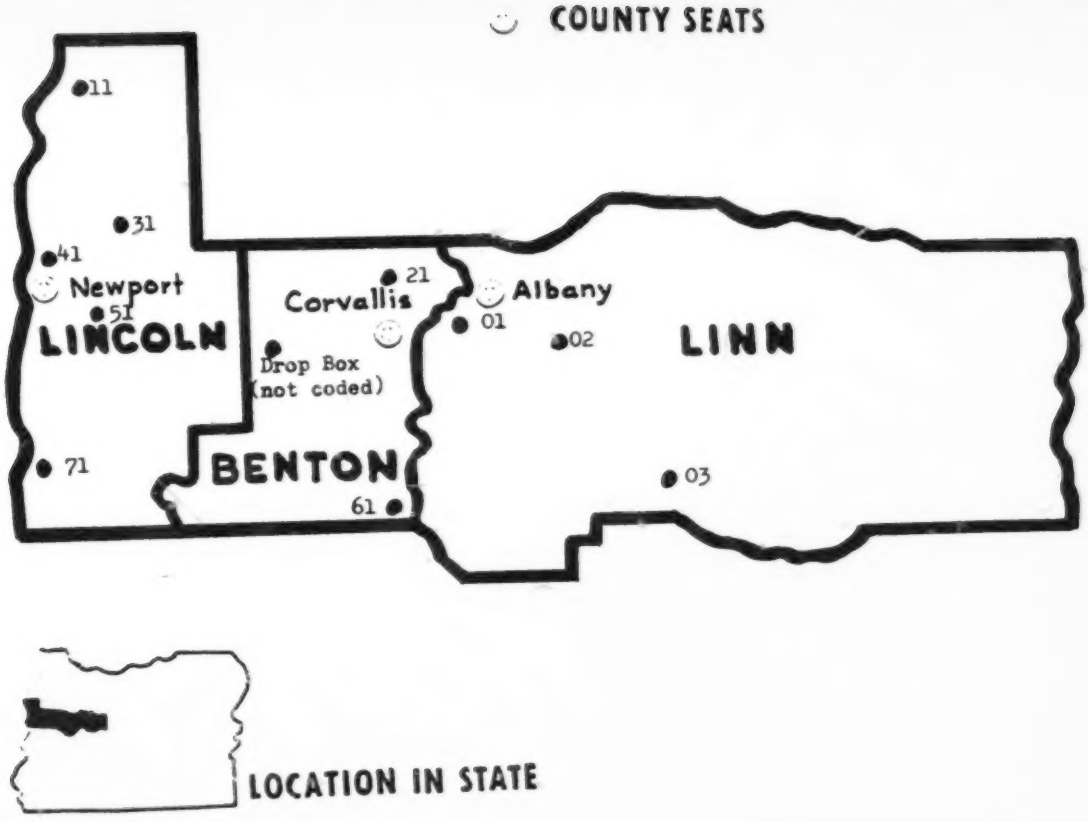


LOCATION IN STATE

County & County Code	Name of Site	Site Code	Owned By	Operated By	Operation	Population Served
Lincoln (21)	Waldport	71	Private	Private	Open Dump	3,500
	Toledo	51	Private	Private	Open Dump	6,500
	Newport	41	Public	Private	Landfill	6,000
	North Lincoln	11	Private	Private	Open Dump	6,000
	Logsden	31	Private	Public	Open Dump	1,000
Benton (02)	Corvallis	21	Private	Public	Landfill	35,000
	Monroe	61	Public		Open Dump	1,500
Linn (22)	Albany	01	Public	Private	Landfill	27,000
	Lebanon	02	Public	Private	Landfill	10,000
	Sweet Home	03	Private	Private	Open Dump	8,000

Suggested Disposal Site Usage:

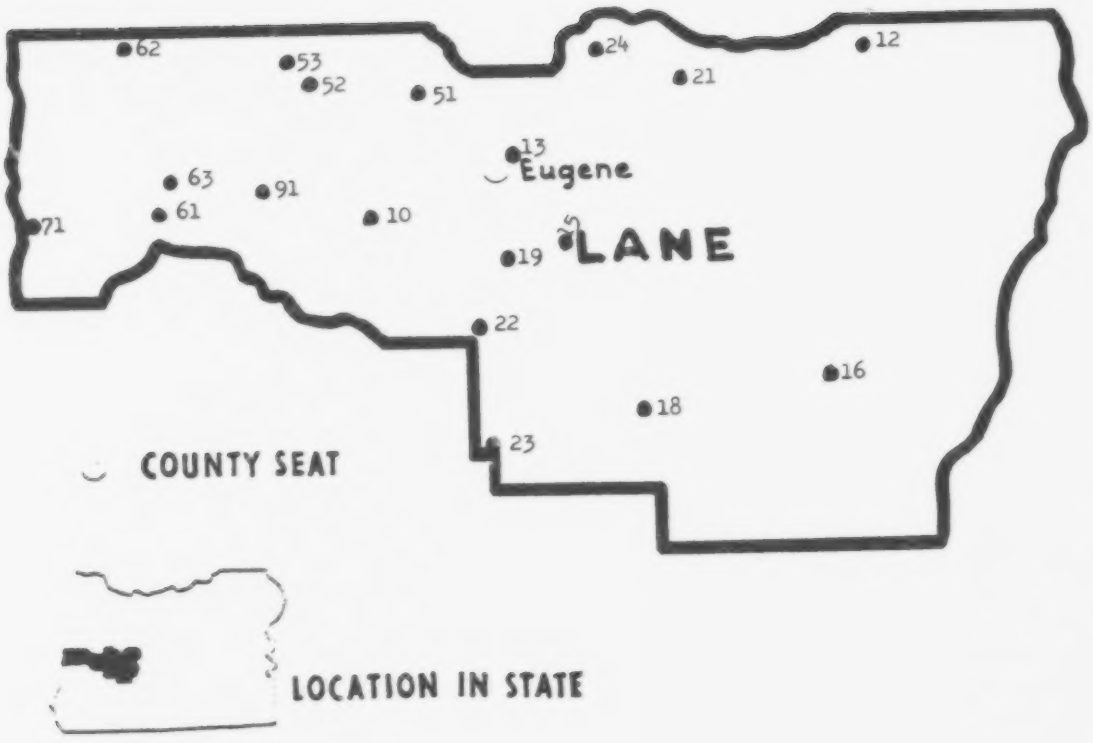
A. Benton County - Corvallis
B. Benton County - Monroe (close or combine with Lane County sites)
C. Linn County - Albany
   Linn County - Sweet Home, Lebanon
   (It may be possible to combine Benton-Linn disposal sites into one operation.)
D. Lincoln County - Toledo, Newport, Siletz
   Lincoln County - North Lincoln communities
   Lincoln County - Waldport


COUNTY SEATS
11
31
41
Newport
51
LINCOLN
71
21
Corvallis
Drop Box
(not coded)
BENTON
61
Albany
01
02
LINN
03
LOCATION IN STATE

County & County Code	Name of Site	Site Code	Owned By	Operated By	Operation	Population Served
Lane (20)	Creswell	19	Public	Public	Open Dump	2,000
	Franklin	51	Public	Public	Landfill	9,000
	Veneta	10		Public	Open Dump	2,500
	Horton	53		Public	Open Dump	300
	Erbs	52		Public	Open Dump	300
	Cottage Grove	22	Private	Public	Open Dump	9,000
	London	23		Public	Open Dump	400
	Disston	18	Private	Public	Open Dump	400
	Oakridge	16		Public	Open Dump	4,000
	Vida	21	Public	Public	Open Dump	2,000
	Rattlesnake	15	Public	Public	Open Dump	2,000
	McKenzie River	12	Public	Public	Open Dump	3,500
	Mohawk	24	Public	Public	Open Dump	1,000
	Florence	71	Public	Public	Open Dump	7,500
	Mapleton	61	Public	Public	Open Dump	1,500
	Swisshome	63	Public	Public	Open Dump	500
	Walton	91	Public	Public	Open Dump	500
	Five River	62	Public	Public	Open Dump	400
	Day Island	13	Public	Public	Sanitary Landfill	135,000

Suggested Disposal Site Usage:

All sites in Lane County are under direction of a <u>county plan</u>. This should continue as a regional approach.

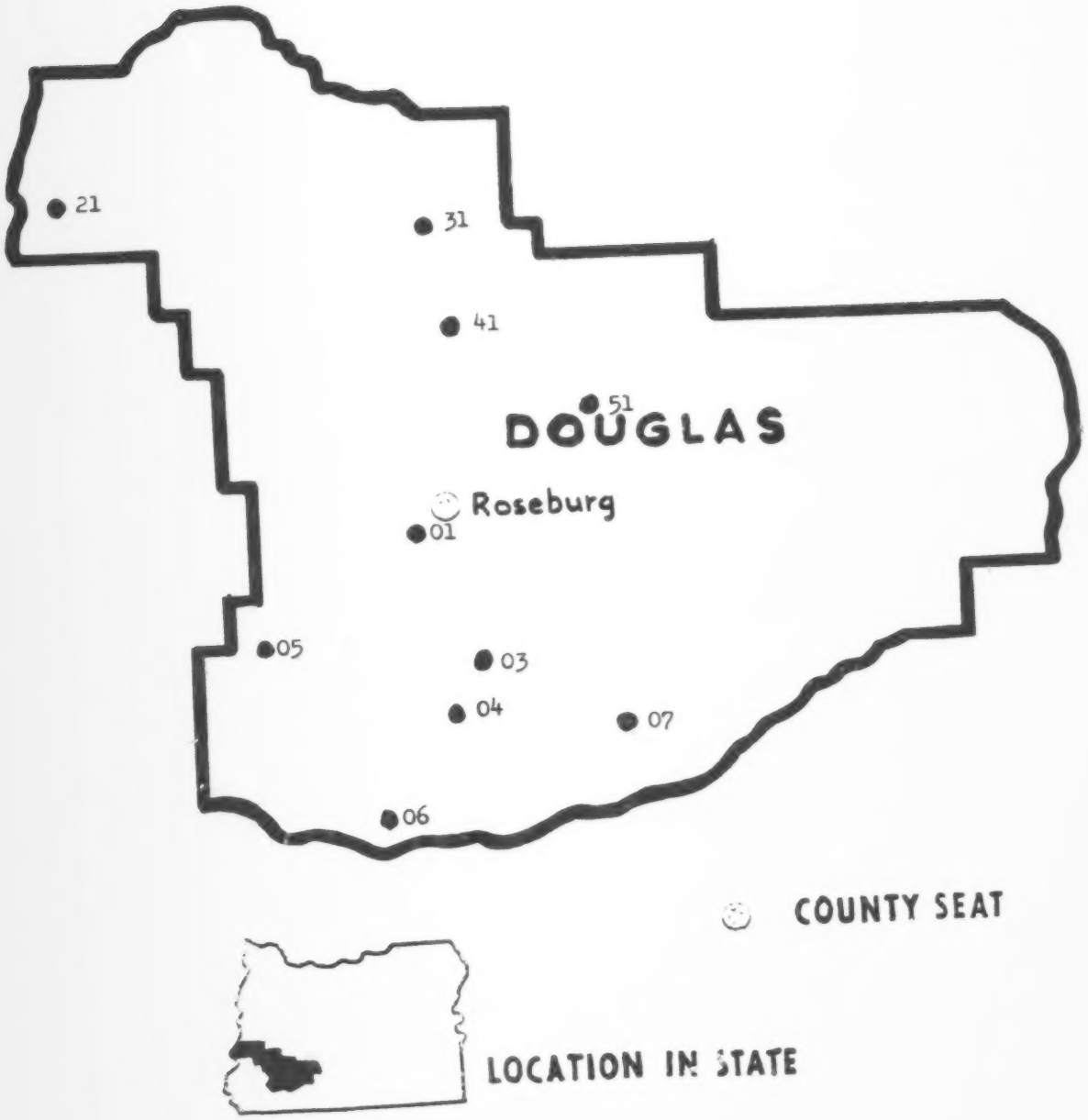

62
53
52
51
24
21
12
13
Eugene
63
91
61
10
71
19
LANE
22
16
18
23
COUNTY SEAT
LOCATION IN STATE

County & County Code	Name of Site	Site Code	Owned By	Operated By	Operation	Population Served
Douglas (10)	Oakland	41	Public	Private	Open Dump	6,000
	Canyonville	04	Private	Private	Open Dump	4,000
	Roseburg	01	Private	Private	Landfill	20,000
	Glide	51	Public	Public	Landfill	5,000
	Camas Valley	05	Public	Public	Landfill	1,500
	Yoncalla	31	Private	Private	Open Dump	2,500
	Tiller	07	Public	Public	Landfill	500
	Reedsport	21	Public	Public	Landfill	6,000
	Glendale	06	Public	Public	Landfill	2,500
	Myrtle Creek	03	Public	Public	Landfill	5,000

Suggested Disposal Site Usage:

Sites in Douglas County are being developed under a county plan. This should continue.

Efforts to include Roseburg, Yoncalla and Canyonville under the county plan.


21
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41
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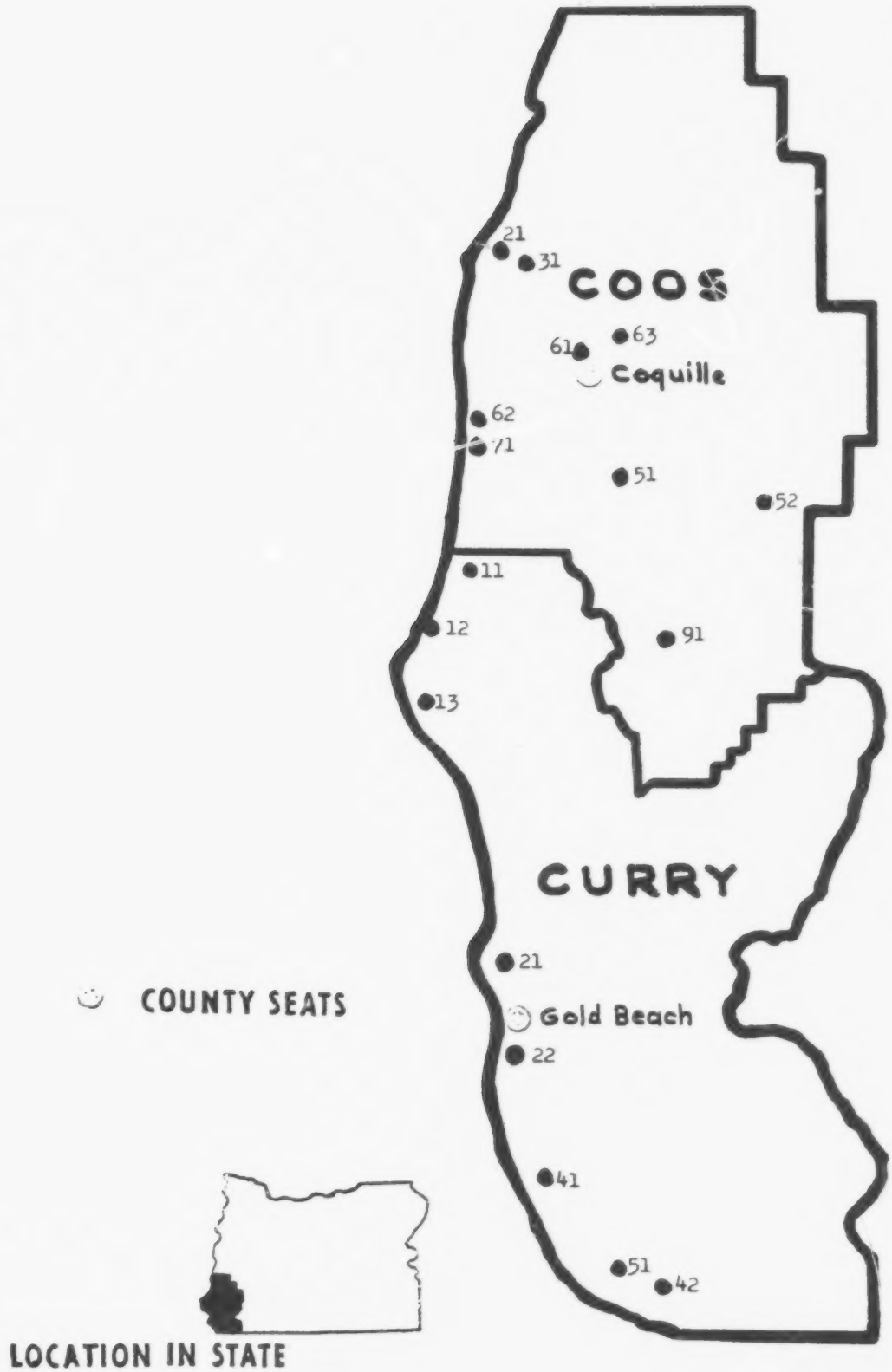
DOUGLAS
Roseburg
01
05
03
04
07
06
COUNTY SEAT
LOCATION IN STATE

County & County Code	Name of Site	Site Code	Owned By	Operated By	Operation	Population Served
Coos (06)	Bandon - County	62	Public	Public	Landfill	1,500
	Coquille	61	Public	Private	Open Dump	5,000
	Fairview	63	Public	Public	Landfill	2,000
	Remote	52	Private	Public	Landfill	500
	Powers	91	Private	Private	Open Dump	1,500
	Bandon - City	71	Public	Private	Open Dump	3,500
	Myrtle Point	51	Public	Private	Open Dump	3,500
	Shingle House	31	Private	Private	Landfill	20,000
	Nickles Road	21	Private	Public	Landfill	6,000
Curry (08)	Langlois	11	Private	Public	Landfill	1,000
	Geisel	21	Private	Public	Landfill	1,000
	Port Orford	13	Public	Private	Open Dump	1,500
	Airport Road	12	Private	Public	Open Dump	500
	Brookings	42	Private	Private	Open Dump	3,500
	Chetco	51	Private	Private	Open Dump	1,200
	Pistol River	41	Private	Private	Open Dump	50
	Gold Beach	22	Public	Private	Open Dump	2,500

Suggested Disposal Site Usage:

Coos County is developing and operating county disposal sites under a county plan. This should continue.

A. Coos County - Coquille and Coos Bay, combine
B. Coos County - Myrtle Point, Powers and Remote
C. Coos County - Bandon
D. Curry County - Port Orford
E. Curry County - Gold Beach
F. Curry County - Langlois


COOS
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63
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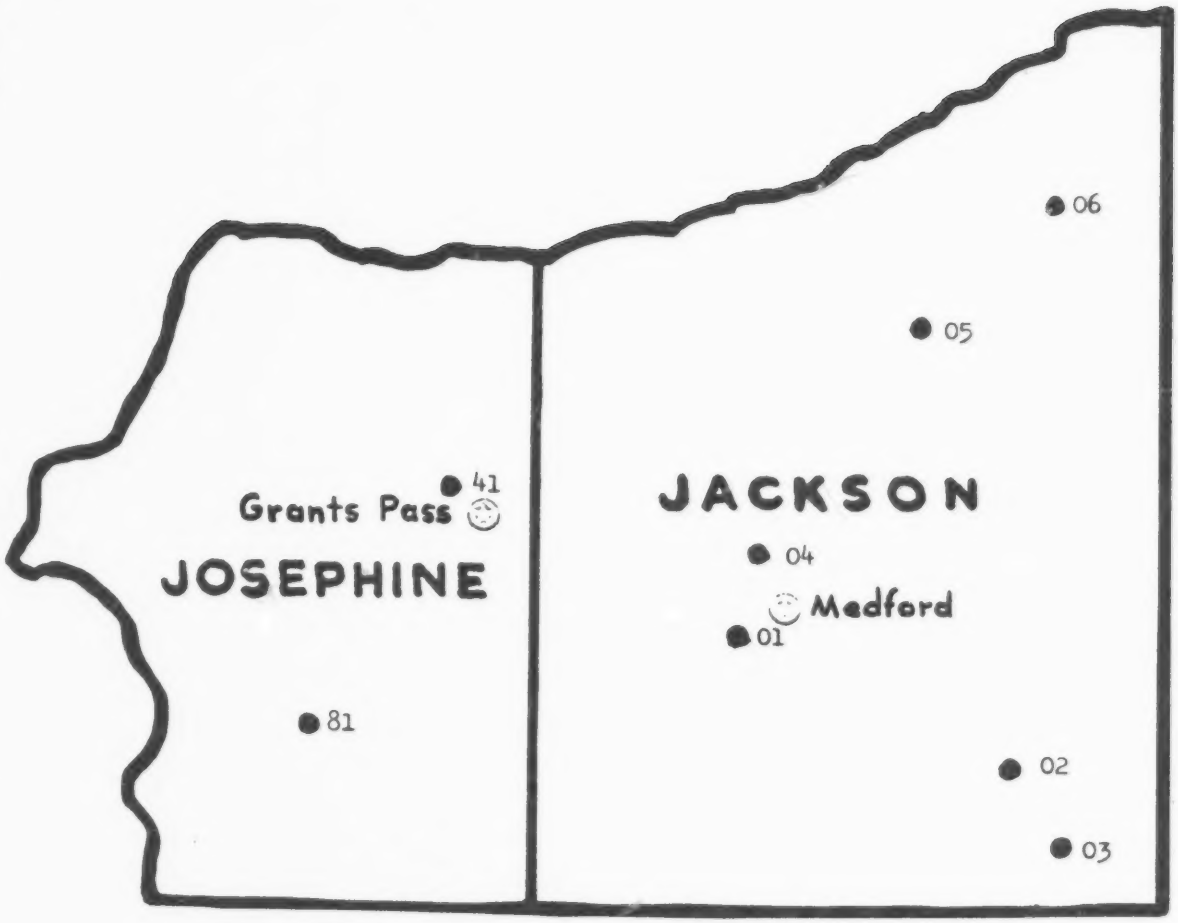
Coquille
62
71
51
52
11
12
91
13
CURRY
21
Gold Beach
22
41
51
42
COUNTY SEATS
LOCATION IN STATE

County & County Code	Name of Site	Site Code	Owned By	Operated By	Operation	Population Served
Josephine (17)	Kerby	81	Public	Public	Landfill	2,000
	Grants Pass	41	Public	Private	Sanitary Landfill	35,000
Jackson (15)	Jacksonville	01	Private	Private	Landfill	15,000
	Ashland	02	Private	Private	Open Dump	6,000
	Lincoln	03			Open Dump	200
	White City	04	Public	Private	Open Dump	15,000
	Butte Falls	05	Private	Private	Open Dump	1,200
	Prospect	06	Private	Private	Open Dump	1,200

Suggested Disposal Site Usage:

A. Josephine County - Grants Pass
B. Josephine County - Kerby
C. Jackson County - Medford, Ashland, Jacksonville
D. Jackson County - Prospect
E. Jackson County - Lincoln



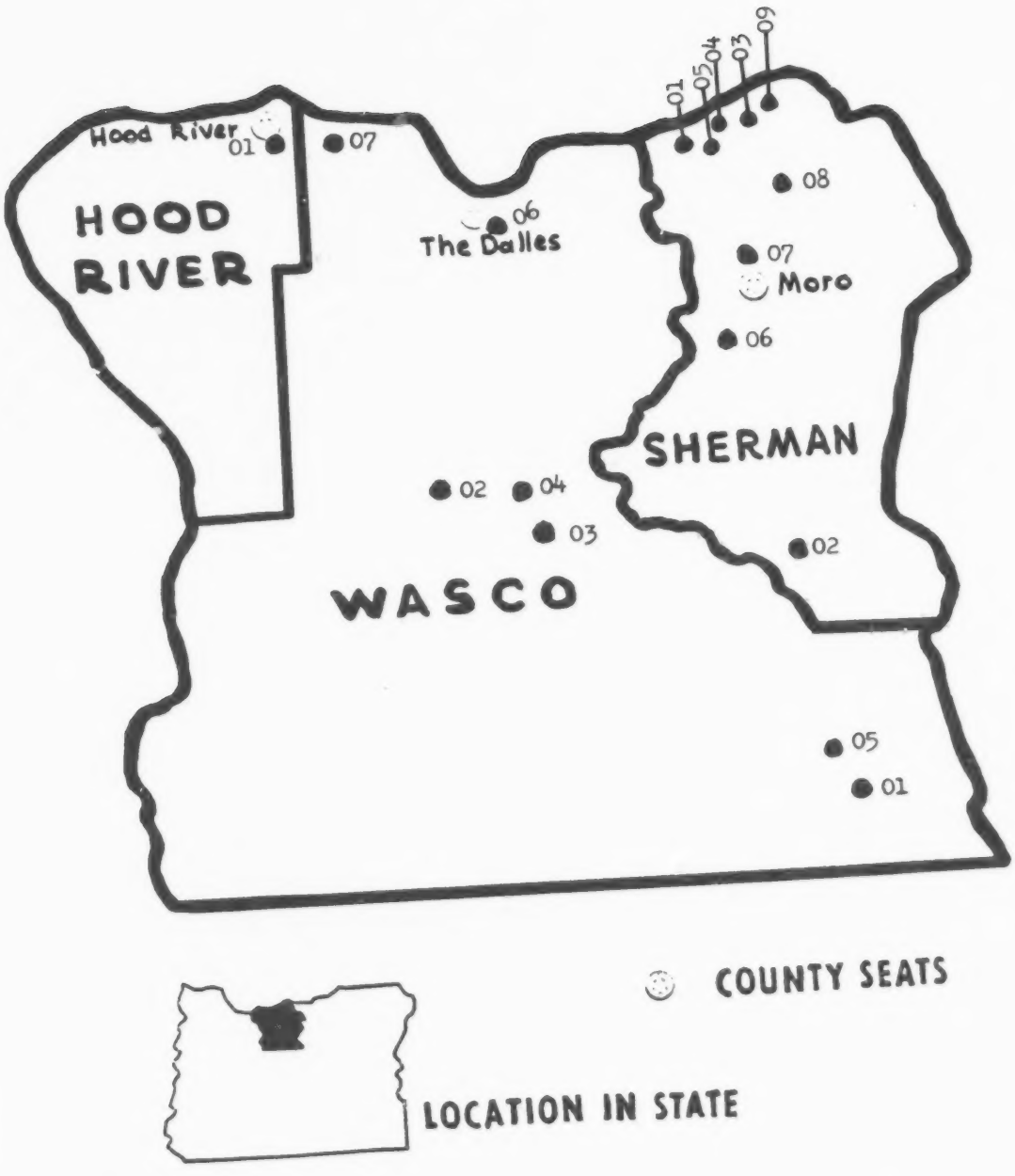
COUNTY SEATS

LOCATION IN STATE

County & County Code	Name of Site	Site Code	Owned By	Operated By	Operation	Population Served
Hood River (14)	Hood River	01	Public	Public	Open Dump	11,000
Wasco (33)	Antelope	01	Public	Public	Open Dump	25
	Wamic	02	Public	Public	Open Dump	100
	Maupin	03	Public	Public	Open Dump	450
	Tygh Valley	04	Private	Private	Open Dump	150
	Shaniko	05	Public	Public	Open Dump	75
	The Dalles	06	Private	Private	Open Dump	12,300
	Mosier	07	Private	Public	Open Dump	1,000
Sherman (28)	Biggs	01	Private	Private	Open Dump	50
	Kent	02	Private		Open Dump	50
	Rufus	03	Private	Private	Open Dump	350
	Dinty's	04	Private	Private	Open Dump	10
	Subota	05	Private	Private	Open Dump	10
	Grass Valley	06	Public	Public	Open Dump	225
	Moro	07	Public	Public	Open Dump	325
	Wasco	08	Public	Public	Open Dump	325
	Davis	09	Public	Public	Open Dump	625

Suggested Disposal Site Usage:

A. Hood River City and Hood River County; or combine with Mosier or with Multnomah County.
B. Wasco County - The Dalles, Mosier
C. Wasco County - Tygh Valley, Maupin (1 site)
D. Wasco County - Shaniko or combine with Grass Valley
E. Sherman County - Biggs, Rufus, Dinty's, Moro, Wasco
F. Sherman County - Grass Valley, Shaniko, Kent


Hood River
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HOOD
RIVER
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The Dalles
01
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04
03
09
08
07
Moro
06
SHERMAN
02
04
03
WASCO
02
05
01
COUNTY SEATS
LOCATION IN STATE

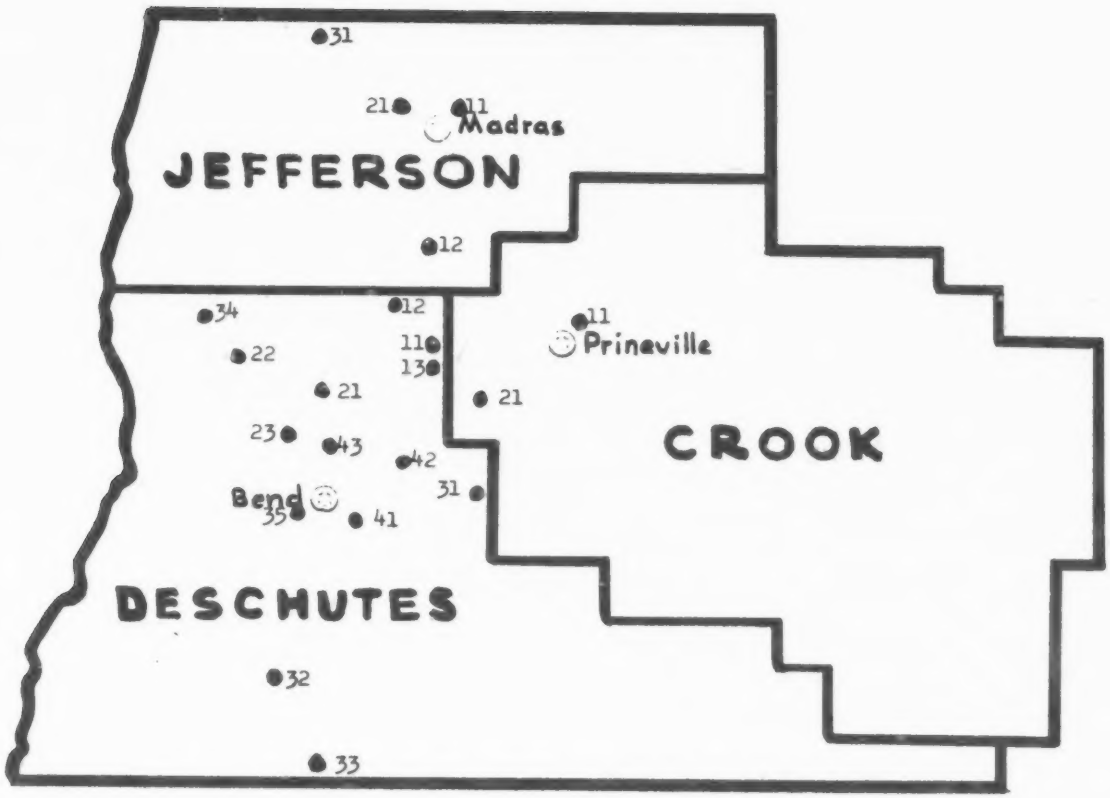
County & County Code	Name of Site	Site Code	Owned By	Operated By	Operation	Population Served
Jefferson (16)	Culver	12	Public	Public	Landfill	1,000
	Willow Creek	21	Public	Public	Open Dump	3,000
	Warm Springs	31	Public	Public	Open Dump	1,500
	Madras	11	Public	Private	Open Dump	1,500
Crook (07)	Prineville	11	Public	Public	Open Dump	7,500
	Powell Butte	21	Public	Public	Open Dump	600
Deschutes (09)	Bend - City	35	Public	Private	Landfill	8,000
	Arnold	41	Public	Public	Sanitary Landfill	5,000
	Tumalo	23	Public	Public	Open Dump	600
	Elder	43	Public	Public	Open Dump	1,000
	McGrath	42	Public	Public	Open Dump	300
	Alfalfa	31	Public	Public	Landfill	300
	Spring River	32	Public	Public	Landfill	600
	Fryrear	22	Public	Public	Landfill	100
	Negus	11	Public	Public	Landfill	3,000
	Lapine	33	Public	Public	Landfill	1,000
	Cline Falls	21	Public	Public	Open Dump	600
	Lower Bridge	12	Public	Public	Open Dump	600
	Sisters	34	Public	Public	Open Dump	800
	Redmond	13	Public	Private	Open Dump	3,500

Suggested Disposal Site Usage:

Deschutes -

Deschutes County has proposed and developed possible county sites. These should be continued.

A. Deschutes County - Redmond, Terrebonne; Powell Butte might be developed.


31
21
11
Madras
JEFFERSON
12
34
12
11
Prineville
22
11
13
21
21
23
43
42
CROOK
Bend
31
35
41
DESCHUTES
32
33
COUNTY SEATS
LOCATION IN STATE

County & County Code	Name of Site	Site Code	Owned By	Operated By	Operation	Population Served
Klamath	Klamath Falls	14	Private	Private	Landfill	35,000
(18)	Bly	13	Public	Public	Landfill	500
	Beatty	12	Public	Public	Landfill	200
	Sprague River	11	Public	Public	Landfill	200
	Bonanza	10	Public	Public	Landfill	500
	Langell Valley	09	Public	Public	Landfill	300
	Malin	08	Public	Public	Landfill	600
	Merrill	07	Public	Public	Landfill	1,000
	Keno	06	Public	Public	Landfill	600
	Chiloquin	05	Public	Public	Landfill	1,200
	Cresent	04	Public	Public	Landfill	300
	Chemult	03	Public	Public	Landfill	200
	Fort Klamath	02	Public	Public	Landfill	200
	Rocky Point	01	Public	Public	Landfill	200
Lake	Lakeview	07	Public	Private	Landfill	3,500
(19)	Adel	06	Private	Private	Open Dump	50
	Plush	05	Private		Open Dump	50
	Paisley	04			Open Dump	25
	Summer Lake	03	Public	Public	Open Dump	50
	Christmas Valley	02	Private	Private	Open Dump	50
	Silver Lake	01	Public	Public	Open Dump	200

Suggested Disposal Site Usage:

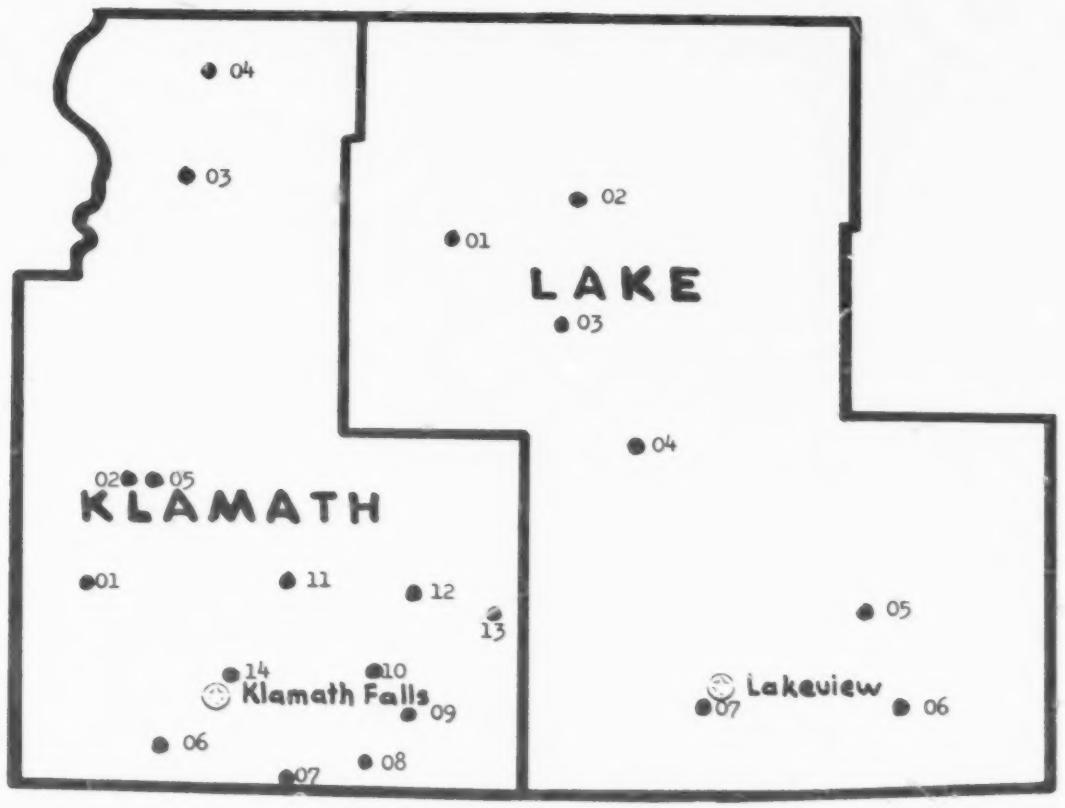
Klamath County -

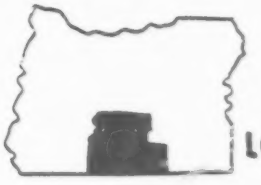
The Klamath County Road Department is developing a site maintenance program. This should continue and better correlation with Klamath Falls disposal site be developed.

Lake County -

Lake County is so wide spread that county-maintained disposal sites are mandatory. Cooperation between the city of Lakeview and Lake County should be developed.

County sites might be reduced to about 3 in number.





LOCATION IN STATE

COUNTY SEATS

County & County Code	Name of Site	Site Code	Owned By	Operated By	Operation	Population Served
Gilliam (11)	Arlington	11	Private	Public	Landfill	1,000
	Condon	21	Public	Public	Open Dump	4,300
Morrow (25)	Ione	21	Public	Public	Open Dump	650
	Lexington	22	Public	Public	Open Dump	700
	Heppner	31	Public	Public	Open Dump	2,200
Umatilla (30)	Pendleton	01	Private	Private	Sanitary Landfill	18,000
	Hermiston	02	Private	Private	Landfill	8,000
	Milton-Freewater	03	Public	Public	Sanitary Landfill	4,200
	Pilot Rock	04	Private	Private	Landfill	1,700
	Three Towns	05	Public	Private	Landfill	1,500
	Weston	06	Private	Public	Landfill	775
	Ukiah	07	Public	Public	Open Dump	120
	Cayuse	08	Private	Public	Open Dump	50
	Meacham	09	Public	Public	Open Dump	225
	Mission	10	Private	Public	Landfill	200
Wheeler (35)	Mitchell	01	Private	Public	Open Dump	500
	Fossil	02	Public	Public	Open Dump	875
	Kinzua	03	Public	Public	Open Dump	375
Grant (12)	John Day	01	Public	Public	Open Dump	1,600
	Retherford	02	Private	Private	Open Dump	1,100
	Woods	03	Private	Private	Open Dump	1,100
	Canyon City	04	Public	Public	Open Dump	625
	Mt. Vernon	05	Public	Public	Open Dump	450
	Prairie City	06	Private	Public	Open Dump	900
	Long Creek	07	Public	Public	Open Dump	300
	Monument	08	Public	Public	Open Dump	150
	Bates	09	Private	Private	Open Dump	25
	Seneca	10	Private	Private	Open Dump	500
	Dayville	11	Private	Public	Open Dump	225
	Granite	12	Public	Public	Open Dump	50

Suggested Disposal Site Usage:

Gilliam County -

Develop county cooperation with the two communities of Arlington and Condon.

Morrow County -

Develop county cooperation with communities with possible consolidation of Lexington-Heppner disposal.

Morrow County (cont.) -

A. Morrow County - Heppner-Lexington
B. Morrow County - Ione

Wheeler County -

Wheeler County is so wide-spread that disposal sites cannot be consolidated.

City-county coordination in disposal site operation should be developed and county operation is suggested.

Grant County -

Consolidation of disposal sites is most important for better operation.

Suggested consolidation -

A. Grant County - John Day, Canyon City, Prairie City, Mt. Vernon (develop 1 site; close 2 private sites - Woods and Retherford)
B. Grant County - Dayville
C. Grant County - Spray
D. Grant County - Monument

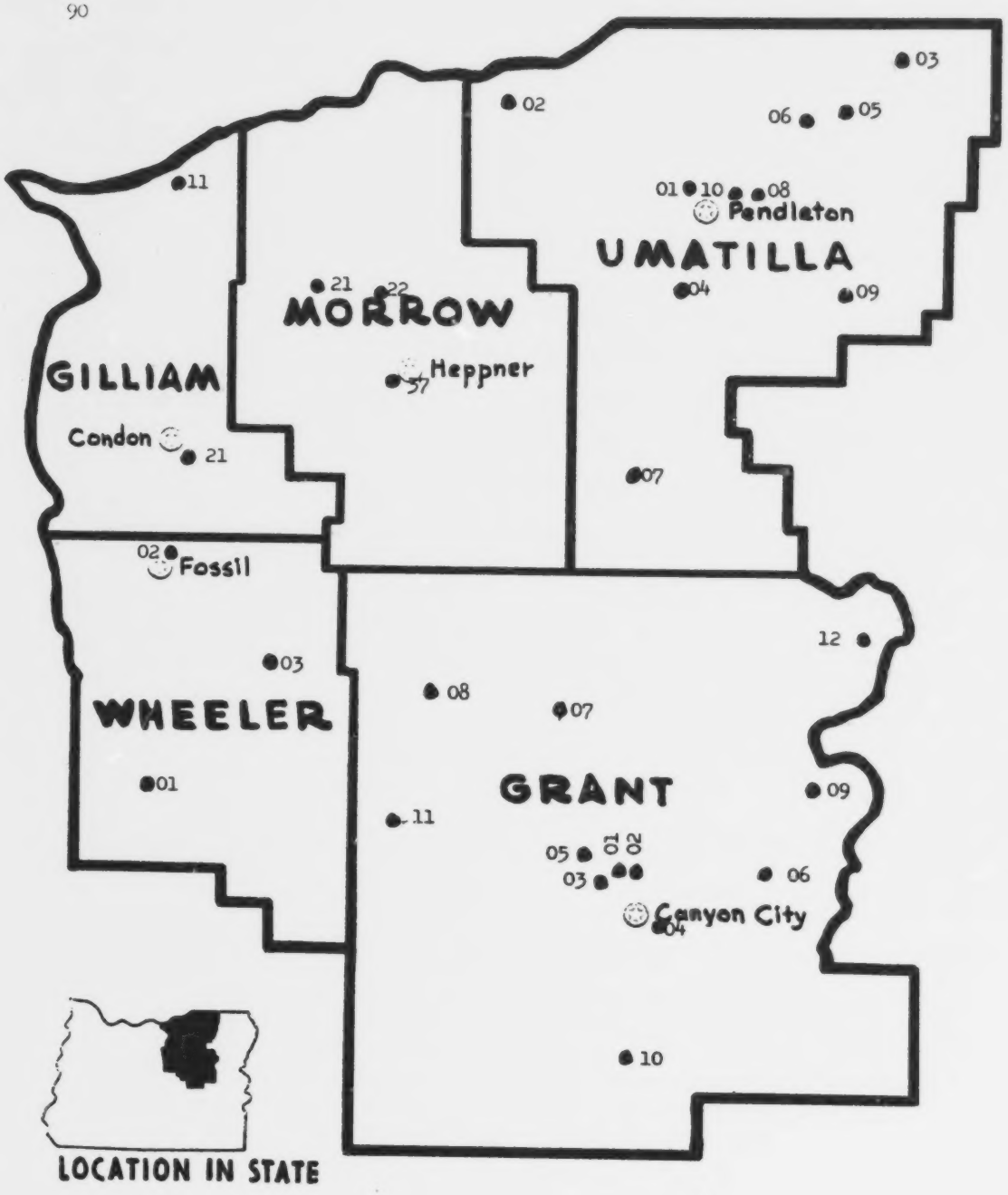
Umatilla County -

Umatilla County should be involved in the operation of the following site -

A. Umatilla County - Ukiah

Cooperative agreement with city and county should be as follows -

B. Umatilla County - Pendleton, Mission, Reith, Pilot Rock (1 site)
C. Umatilla County - Milton-Freewater, Umapine (1 site)
D. Umatilla County - Indian Reservation-Cayuse site
E. Umatilla County - Adams, Athena, Helix (include Weston if possible)
F. Umatilla County - Hermiston, Boardman, Umatilla City, Stanfield, Echo


03
02
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01
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Pendleton
UMATILLA
21
22
MORROW
04
09
GILLIAM
Heppner
57
Condon
21
07
02
Fossil
12
03
08
07
WHEELER
01
GRANT
09
11
05
01
02
03
06
Canyon City
04
10
LOCATION IN STATE
COUNTY SEATS

County & County Code	Name of Site	Site Code	Owned By	Operated By	Operation	Population Served
Wallowa (32)	Enterprise	51	Public	Private	Open Dump	2,600
	Joseph	41	Public	Public	Open Dump	1,500
	Wallowa	31	Public	Public	Open Dump	1,500
Union (31)	Union	01	Public	Private	Open Dump	1,500
	North Powder	02	Public	Public	Open Dump	400
	La Grande	03	Private	Private	Landfill	10,000
	Elgin	04	Public	Public	Open Dump	1,300
	Conklin	05	Private	Private	Open Dump	800
Baker (01)	Baker	01	Public	Private	Sanitary Landfill	10,000
	Richland	02	Public	Private	Open Dump	225
	Halfway	03	Public	Private	Open Dump	500
	Sumpter	04	Public	Private	Open Dump	100
	Unity	05	Private	Private	Open Dump	200
	Haines	06	Public	Private	Open Dump	325
	Huntington	07	Public	Private	Open Dump	700

Suggested Disposal Site Usage:

A. Baker County - Baker City and Haines
B. Baker County - Sumpter
C. Baker County - Richland, Halfway
D. Baker County - Huntington
E. Baker County - Hereford, Unity, Ironside (Malheur County)

WALLOWA
04
31
51
Enterprise
41
03
05
La Grande
UNION
01
02
06
01
Baker
03
02
05
BAKER
04
07
COUNTY SEATS
LOCATION IN STATE

County & County Code	Name of Site	Site Code	Owned By	Operated By	Operation	Population Served
Harney	Drewsey	01	Public	Public	Open Dump	150
(13)	Crane	02	Private		Open Dump	150
	French Glen	03	Public	Public	Open Dump	100
	Burns-Hines	04	Public	Private	Landfill	5,500
Malheur	Ontario	14	Private	Private	Landfill	10,000
(23)	Vale	15	Public	Public	Open Dump	3,000
	Harper	11	Public	Public	Landfill	25
	Little Valley	13	Public	Public	Open Dump	50
	Antelope	16	Public		Open Dump	50
	Beulah	12	Public	Public	Open Dump	25
	Juntura	10	Public	Public	Open Dump	200
	Willow Creek	09	Public	Public	Open Dump	200
	Brogan	08	Public		Open Dump	50
	Ironside	07	Private		Open Dump	100
	Lytle Boulevard	06	Public	Public	Landfill	1,000
	Mitchell Butte	05	Public	Public	Landfill	150
	Adrian	04	Public	Public	Open Dump	800
	Nyssa	03	Public	Private	Open Dump	4,000
	Jordan Valley	02	Public	Public	Open Dump	500
	McDermitt	01	Public	Public	Open Dump	600

Suggested Disposal Site Usage:

Harney County -

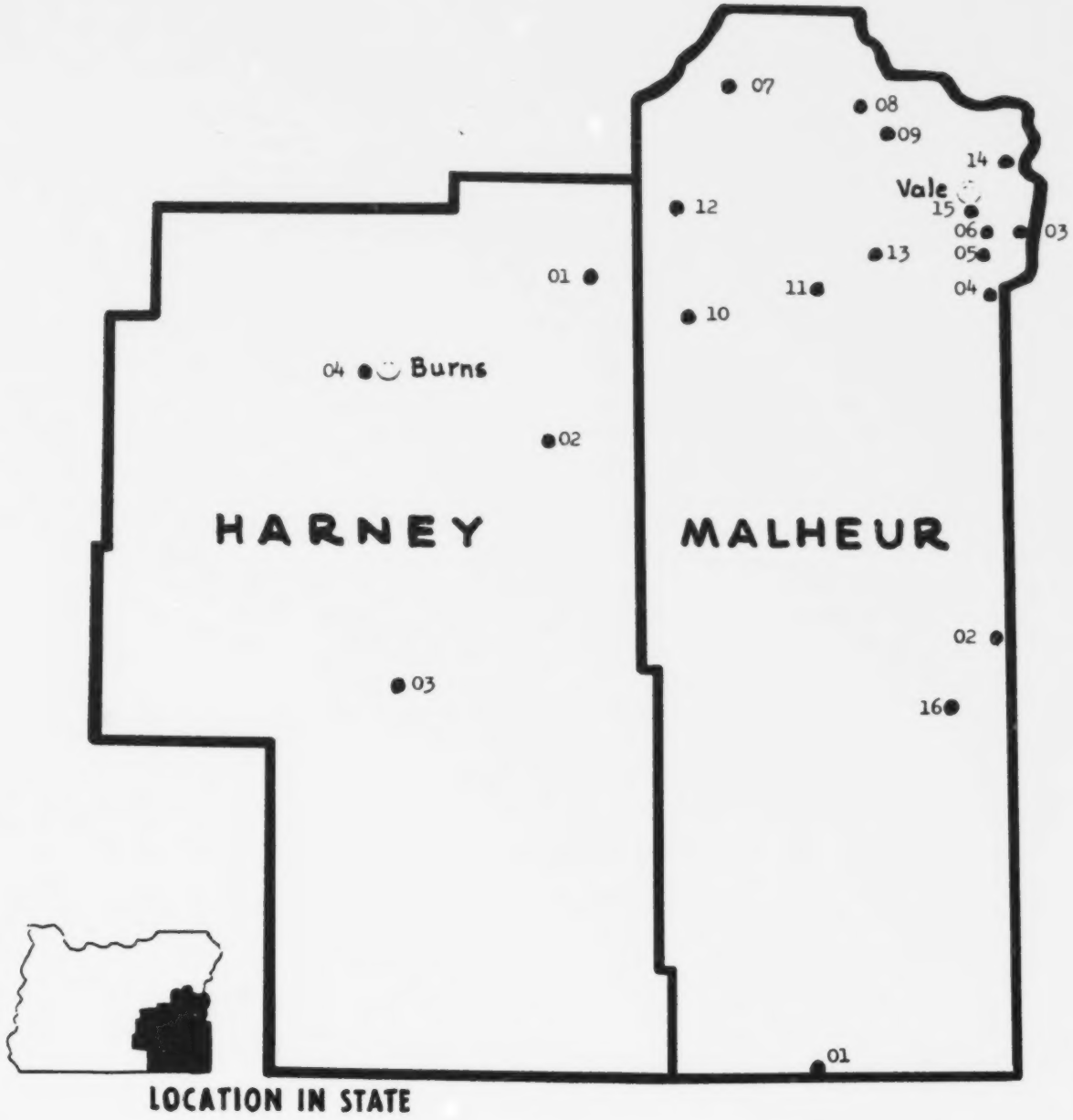
County maintain rural sites and cooperate with Burns-Hines in operation.

Malheur County -

A. Malheur County - Nyssa-Vale-Ontario, 1 disposal site
B. Establish county sites and operate -

Jordan Valley - 1 site
McDermitt - 1 site
Juntura - 1 site
Brogan-Ironside area - 1 site

C. Continue to operate county sites at Harper, Lytle Boulevard, etc.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Burns
02
HARNEY
MALHEUR
02
03
16
01
LOCATION IN STATE
COUNTY SEATS

ADDENDUM B

Proposed organization of a county solid waste management committee should include as a minimum:

One member of the county court

The county road master or engineer

A representative of the county health department

One representative from the major city councils in the county

A representative of the garbage collection services in the county

A member of the staff of the county planning commission

GENERAL INFORMATION
PROPOSED SOLID WASTE LAND DISPOSAL SITE

NAME OF SITE _____

LOCATION OF SITE _____

_____

COUNTY _____ DATE _____

Check Appropriate Box or Fill in Requested Information

1. PROPOSED SITE OWNED BY - Public ____ Private ____
   Name _____
   Address _____

2. SITE WILL BE OPERATED BY - Public ____ Private ____
   Name _____
   Address _____

3. SITE DESCRIPTION - T ____ R ____ S ____ Tax Lot ____ Total Acreage _____
   Distance from Nearest Community _____ Name of Community _____
   Distance from Nearest Residence _____ Name of Nearest Public Highway _____
   _____ Distance from Highway _____
   Distance to Nearest Well or Spring _____ feet Map of Proposed Site Attached ___
   Yes ☐ No ☐

4. ACCESS ROAD - Existing ☐ Will be Constructed ☐
   Maintained By _____ Type of Road Surface _____
   Width _____ Length _____

5. WILL SITE BE OPEN TO PUBLIC - Yes ☐ No ☐ Fee Charged - Yes ☐ No ☐
   Planned Number of Days Per Week ____ Hours of Operation ____AM ____PM 24 hours ☐

6. WILL CARETAKER BE ON DUTY DURING OPERATION HOURS - Yes ☐ No ☐
   Planned Facilities for Caretaker - Suitable Shelter ☐ Toilet ☐ Handwashing ☐
   None ☐

7. POPULATION DATA - Estimated Population Served by Site _____

8. ESTIMATED LIFE EXPECTANCY OF SITE - Number of Years _____

9. ZONING
   Is Proposed Site in Zoned Area - Yes ☐ No ☐ Enforcement Agency _____
   _____ Present Land Use _____
   Restrictions _____

10. HAS PUBLIC HEARING ON PROPOSED SITE BEEN HELD - Yes ☐ No ☐ Is a Public Hearing Planned Before the Site is Operated - Yes ☐ No ☐

11. GENERAL CHARACTER OF SITE (Operational Area) - Quarry or Barrow Pit ☐ Level ☐ Gully-Canyon ☐ Hillside ☐ Marsh, Tideland or Flood Plain ☐

12. PLANNED USE OF COMPLETED SITE - Not determined ☐ Park or Recreational Area ☐ Agriculture ☐ Light Construction ☐ Other _____

13. MARK ITEMS WHICH WOULD BE EXCLUDED - None ☐ All Putrescible Wastes ☐ Bulky Combustible Material ☐ Dead Animals ☐ Waste Oil ☐ Sewage Solids ☐ Junk Automobiles ☐ Large Appliances ☐ Demolition Wastes ☐ Tires ☐ Hazardous Materials ☐ Other _____

14. BURNING OF BULKY COMBUSTIBLES PLANNED - Yes ☐ No ☐ (Burning Area Must be Located in Separate Area 500 feet Minimum Distance from Operation Area)

15. PLANNED FIRE PROTECTION - None ☐ Firebreak ☐ Water Under Pressure ☐
Other _____

16. PLANNED SOURCE OF WATER UNDER PRESSURE DURING EQUIPMENT OPERATION - Surface ☐
Well ☐ 300 Gallon or Larger Storage Tank ☐ Other _____

17. PLANNED FREQUENCY OF COVER - Daily ☐ Twice-Weekly ☐ Weekly ☐ Monthly ☐
Other _____

18. COVER MATERIAL - Planned Source of Cover Material - On Site ☐ Imported ☐
Both ☐ Other _____
Characteristics of Soil - Loam ☐ Sand ☐ Clay ☐ Sandy Clay ☐ Gravel ☐

19. SURFACE WATER DRAINAGE PLANNED - Yes ☐ No ☐ Undetermined ☐
Proposed Method of Control _____

20. ESTIMATED GROUND WATER LEVEL - Have Test Holes Been Dug - Yes ☐ No ☐ Date _____
Number of Test Holes _____ Average Depth _____ Ground Water Encountered
Yes ☐ No ☐ Average Depth _____ Sketch of Test Holes Attached - Yes ☐
No ☐

21. EQUIPMENT PLANNED FOR MAINTENANCE OF SITE - Rubber-Tired Front-End Loader ☐ Crawler-Type Front-End Loader ☐ Tractor (bulldozer) ☐ Steel-Wheel Compactor ☐
Dragline or Shovel ☐ Scraper - Pull ☐ Scraper, Self-Propelled ☐
Other _____

22. HAVE OTHER AGENCIES HAVING JURISDICTION BEEN CONTACTED (Air, Water, etc.) - Yes ☐
No ☐ _____
_____
_____
Reports Attached - Yes ☐ No ☐ Number of Reports ____

23. PERSON RESPONSIBLE FOR OPERATION OF SITE
Name _____
Title _____
Address _____
Phone _____

24. REMARKS: _____
_____
_____
_____
_____

SIGNATURE OF PERSON COMPLETING FORM _____

TITLE _____ Date _____

SOLID WASTE LAND DISPOSAL
SITE EVALUATION

DISPOSAL SITE _____ COUNTY _____

METHOD OF OPERATION _____ DATE _____ WEATHER _____

LOCATION _____ POPULATION SERVED _____

_____ SOIL CONDITIONS _____

X - INDICATES VIOLATION OF OAR, CHAPTER 333

1. ACCESS ROAD
   - ____ Clearly Marked
   - ____ Well Maintained, All Weather
   - ____ No Accumulation of Litter
2. CONTROLLED USE OF FACILITY
   - ____ Necessary Signs
   - ____ Limited Unloading Area
   - ____ Satisfactory Fire Protection
3. BLOWING LITTER
   - ____ Controlled
   - ____ No Accumulation
4. DUST CONTROL
   - ____ Provided, If Needed
5. BURNING, Yes ☐ No ☐
   - ____ Separated, Not Less Than 500'
   - ____ No Putrescible-Hazardous Material
   - ____ Accidental Fire Protection
   - ____ Required Burning Permits
6. WATER SUPPLY, Well ☐ Surface ☐ Tank ☐
   - ____ 300-gallon Minimum - Under Pressure
   - ____ Available During Equipment Operation
7. SALVAGE, Yes ☐ No ☐
   - ____ Removed Daily
   - ____ Prohibited Items not Salvaged
8. HAZARDOUS WASTES ACCEPTED, Yes ☐ No ☐
   - ____ Special Handling
9. DRAINAGE CONTROL
   - ____ Diversion of Surface Water
   - ____ No Dumping in Ground Water
   - ____ No Visible Leachate
10. VECTOR CONTROL
    - ____ Satisfactory
    - Insects ☐ Rodents ☐ Birds ☐
11. SIZE OF WORKING FACE
    - ____ Confined for Easy Maintenance
12. SPREADING AND COMPACTION
    - ____ Necessary Equipment
    - ____ Spread in Shallow Layers
    - ____ Compacted Thoroughly
13. COVER MATERIAL
    - ____ Available-Imported if Necessary
    - ____ Suitable Type
14. APPLICATION OF COVER MATERIAL
    - (Indicate ☐ Daily Present ☐ ____ Times per Week Schedule) ☐ Monthly
    - ____ Covering Schedule Satisfactory
    - ____ Compliance - 1/4 Mile Requirement
    - ____ No Waste Exposed After Covering
15. FINAL COVER - GRADING
    - ____ Compacted Depth of 2 Feet
    - ____ Uniform Layer
    - ____ No Erosion of Fill
    - ____ Stabilization of Completed Areas
16. CARETAKER ON DUTY*, Yes ☐ No ☐
    - ____ Suitable Shelter
    - ____ Toilet Facilities
17. EQUIPMENT WASHING AREA*, Yes ☐ No ☐
    - ____ Properly Maintained and Cleaned
    - ____ Approved Waste Water Disposal
18. STAND-BY EQUIPMENT
    - ____ Available in Case of Breakdown
19. OPERATIONAL PLAN
    - ____ Satisfactory

*Recommended

Days Per Week Open to Public _____ Hours Open to Public ____ AM ____ PM ☐ 24 Hours

Dumping Fee - Yes ☐ No ☐

REMARKS: _____

PERSON INTERVIEWED _____ TITLE _____

PERSON COMPLETING FORM _____ TITLE _____

Subdivision 8

STORAGE, COLLECTION TRANSPORTATION AND DISPOSAL OF SOLID WASTE

[ED. NOTE: Unless otherwise specified sections 38-005 through 38-025 of this chapter of the Oregon Administrative Rules Compilation were adopted by the Board of Health, January 30, 1969, and filed with the Secretary of State, February 4, 1969, as Administrative Order HB 211.]

38-005 GENERAL INFORMATION AND DEFINITIONS. As used in these Regulations, unless the context requires otherwise:

(1) "Board" means the State Board of Health.

(2) "Cell" is that portion of solid waste in a disposal site that is compacted and covered on all sides with soil, gravel, cinders or similar inert materials.

(3) "Collection Vehicle" is any vehicle used to transport solid waste.

(4) "Composting" is the process of biochemical degradation of organic waste under controlled conditions.

(5) "Disposal Site" means any land used for the disposal of solid wastes including, but not limited to, dumps, landfills and composting plants, but does not include a landfill site which is not used by the public either directly or through a service and which is used by the owner or tenant thereof to dispose of sawdust, bark, soil, rock, building demolition material or nonputrescible industrial waste products resulting from the process of manufacturing.

(6) "Hazardous Solid Waste" is solid waste that may, by itself or in combination with other solid waste, be infectious, explosive, poisonous, caustic or toxic or otherwise dangerous or injurious to human, plant or animal life.

(7) "Incinerator" means a combustion device specifically designed for the reduction, by burning, of solid, semisolid or liquid combustible waste.

(8) "Landfill" is the disposal of solid waste by compacting and covering solid waste at specific designated intervals but not each operating day.

(9) "Leachate" is liquid that has percolated through solid waste.

(10) "Operational Area" is the cell or area in which solid waste is actively being deposited.

(11) "Person" means the state, any individual, public or private corporation, political subdivision, governmental agency, municipality, industry, copartnership, association, firm, trust, estate or any other legal entity whatsoever.

(12) "Putrescible Material" is organic material that can decompose, and may give rise to foul smelling, offensive products.

(13) "Sanitary Landfill" is the disposal of solid waste by compacting and covering at least once each operating day.

(14) "Service Area" is the geographic area in which solid waste is collected or which a disposal site serves.

(15) "Solid Waste" means all putrescible and nonputrescible wastes, whether in solid or liquid form, except liquid-carried industrial wastes or sewage or sewage hauled as an incidental part of a septic tank or cesspool cleaning service, but including garbage, rubbish, ashes, sewage sludge, street refuse, industrial waste, swill, demolition and construction waste, abondoned vehicles or parts thereof, discarded home and industrial appliances, manure, vegetable or animal solid and semisolid waste, dead animals and other discarded solid materials.

(16) "Transfer Station" is a unit or structure at which solid waste is moved from one storage unit or collection vehicle to another, or which is used as temporary storage for solid waste.

(17) "Water" or "waters of the state" include lakes, bays, ponds, impounding reservoirs, springs, wells, rivers, streams, creeks, estuaries, marshes, inlets, canals, the Pacific Ocean within the territorial limits of the State of Oregon and all other bodies of surface or underground waters, natural or artificial, inland or coastal, fresh or salt, public or private (except those private waters which do not combine or effect a junction with natural surface or underground waters), which are wholly or partially within or bordering the

state or within its jurisdiction.

38-010 GENERAL RULES FOR ALL DISPOSAL SITES.

(1) General Information. Any person proposing to develop, operate or maintain a disposal site for solid waste shall furnish evidence to the Board that the disposal site is planned for orderly development and operation including the following:

(a) Topographical information using 10-foot gradients showing existing roads, streams, ponds and lakes; existing buildings and well locations.

(b) Geological characteristics of the disposal site, including soil depths and characteristics.

(c) Information as to the ultimate use and life expectancy of the disposal site including estimated population to be served, type of disposal operation and source and availability of material to be used as cover.

(d) Disposal site for ash and residue from incinerator or composting operation.

(e) Special wastes to be disposed.

(2) Distances. All disposal site operations, except sanitary landfills, incinerators or mechanical composting, shall be located a minimum distance of 1/4 mile from the nearest existing general residential or commercial area other than that used by the landfill operator.

(3) Drainage.

(a) The disposal site shall be so located or so sloped that surface drainage will be diverted around or away from the operational area of the site.

(b) Truck washing facilities, if provided, shall have a catch basin and drainage system to carry the waste water to a waste water disposal system.

(4) Access Roads. All weather roads shall be provided from the public highway and county roads to the disposal site. Access roads shall be designed to minimize traffic congestion and hazards.

38-015 SOLID WASTE DISPOSAL OPERATION.

(1) General.

(a) Salvage.

(A) Salvage operations shall be under the supervision of the person owning or operating the disposal site.

(B) Salvage shall be removed from the disposal site at the end of each operating day.

(C) Food products, hazardous materials, containers used for hazardous materials, or furniture and bedding with concealed filling shall not be salvaged from a disposal site.

(D) Waste metal not salvaged at the end of each operating day, such as, but not limited to, car bodies, refrigerators, washing machines or other metallic objects, shall not be placed on any bank of or in any waters of the state, but shall be disposed only in a landfill or sanitary landfill.

(b) Vector Control. Rodent and insect control measures shall be provided.

(c) Signs and Caretakers. Informational and directional signs relating to the dumping of solid waste shall be posted at all disposal sites.

(d) Water Under Pressure. Except in extreme freezing conditions, water under pressure from a water supply or pressurized tank shall be available when landfil equipment is being operated at the site. Pressure tanks shall have a capacity of not less than 300 gallons.

(e) Burning On Any Premise. Putrescible material shall not be burned on the premise except in an incinerator that is capable of reducing the material to non-putrescible waste.

(2) Sanitary Landfill And Landfill Operations.

(a) Frequency of Cover. When putrescible material is deposited at a disposal site, cover material shall be applied at intervals necessary to prevent the hazards cited in this subsection. The Board, person duly authorized by the Board or county sanitarian may approve less frequent coverage where he finds that weather conditions or other conditions make it impossible to meet the normal required cover schedule. In granting permission for less frequent cover, the Board, person duly authorized by the Board or county sanitarian may attach any conditions he finds necessary to limit the operation under or for the duration of the exemption to prevent or inhibit creation of any hazards cited in this subsection. Cover material shall be

applied at intervals necessary to prevent:

(A) vector production and sustenance;

(B) conditions for transmission of disease to man and animals;

(C) air pollution;

(D) pollution of surface and ground water;

(E) hazards to service or disposal workers or to the public.

(b) Diversion.

(A) Drainage ditches shall drain surface water away from the filled area.

(B) Drainage ditches shall be constructed to allow free flow of water.

(c) Blowing Debris. Wind-carried material shall be controlled by a fence or other methods.

(d) Compaction and Cover.

(A) Except as provided in paragraph (f) of this section, there shall be no open burning of solid waste at the disposal site.

(B) Except as provided in paragraph (f) (A) of this section, solid waste deposited at a disposal site shall be compacted and covered.

(C) Provision shall be made for winter cover material.

(D) Final cover over the completed fill shall be not less than two (2) feet of compacted earth.

(E) Finished slope of final cover shall conform to ultimate site use.

(F) A maintenace program for control of erosion and stabilization of the fill shall be provided after completion of the filling operation.

(e) Auxiliary Equipment. Provisions shall be made for auxiliary or stand-by equipment for operation of the disposal site.

(f) Bulky Combustibles.

(A) Bulky combustible materials such as trees, brush and similar material may be burned, but such burning shall not be less than 500 feet from the present operational area of the disposal site.

(B) Burning permits, as provided under state statute or county ordinance, shall be obtained for special burning areas.

(C) Hazardous or putrescible materials shall not be allowed in the burning area.

(D) Provisions against accidental fire shall be provided.

(3) Incinerator Operation. If ash and residue from an incinerator contains putrescible material, such material shall be deposited in a sanitary landfill.

(4) Composting Plant Operation.

(a) The composting plant shall be operated at all times to conform to manufacturers' operating instructions or to patent process.

(b) All portions of the compostable waste shall be subjected to treatment.

(c) Temperature control and measurement devices shall be an integral part of the system.

(d) Compost shall be removed from the site not later than one year after treatment is completed.

(e) Solid waste that is nonreducible by composting shall be disposed of in a sanitary landfill.

(5) Special Waste Disposal.

(a) Industrial Waste. Operation of disposal sites for industrial solid waste shall meet the minimum criteria for solid waste disposal sites such as a sanitary landfill, landfill, incinerator or composting operation.

(b) Agriculture Solid Waste.

(A) Residues from agricultural practices which are not used for fertilizer or for other productive purpose and are not salvageable shall be disposed of in a landfill, sanitary landfill, incinerator or composting operation.

(B) Land surfaces upon which residues from agricultural practices are deposited as fertilizer or for disposal shall be worked as soon as practicable.

(c) Hazardous Waste.

(A) Whenever any hazardous materials or materials that cannot be properly disposed of are refused by the operator of the site, notification of such refusal shall be referred to the Board by the site operator.

(B) Information as to the type and quantity of such hazardous waste shall be provided to the disposal site operator and to the State Board of Health by the person discarding the materials.

(d) Demolition Waste. Building demolition, construction wastes or similar wastes free of putrescible or hazardous material may be deposited in a disposal site at which the Board determines a health hazard may not be created.

38-020 STORAGE AND COLLECTION.

(c) Nuisance Control. Storage of solid waste shall not create vector production and sustenance, conditions for transmission of diseases to man and animals and hazards to service or disposal workers or to the public.

(2) Solid Waste - Storage Removal and Collection.

(a) Solid wastes containing putrescible materials shall be stored in closed containers.

(b) Containers shall comply with the following:

(A) Individual containers for manual pickup shall have a tightfitting closing device, hand holds or bales, be in good condition and have a maximum capacity of thirty-two (32) gallons. Collectors may refuse to pick up containers of a gross weight of more than seventy-five (75) pounds.

(B) Storage bins or storage vehicles shall be leak-proof, have tight lids or covers that may be easily opened manually and shall have suitable fittings to facilitate removal or emptying by mechanical means.

(C) Containers, storage bins or storage vehicles shall be washable or have liners of paper, plastic or similar materials, or both.

(D) Storage houses or rooms, if provided, shall be of cleanable, rodent-proof construction with proper drainage. If not refrigerated, such rooms shall be adequately vented and all openings shall be screened.

(E) Unless special service or special equipment is provided by the collector for handling unconfined waste, materials such as rubbish and refuse, brush, leaves, tree cuttings and other debris for manual pickup and collection shall be in securely-tied bundles or in boxes, sacks, or other receptacles, and solid waste so bundled shall not exceed 60 pounds in weight and shall not be more than 4 feet in length.

(F) During mechanical transportation, containers used for solid waste shall be fitted with tight covers.

(c) Removal Frequency. Putrescible solid waste shall be removed from the premises at regular intervals not to exceed 7 days. Other solid waste shall be removed at regular intervals to prevent rodent, insect, fire odor and nuisance problems.

(d) Cleaning of Storage Area. Areas around storage containers shall be cleaned regularly to maintain the area free from rodent and insect attractants, litter, fire hazards and other nuisance problems.

(3) Special Wastes

(a) Agricultural Wastes. Residues from agricultural practices that become wastes shall be disposed of in a disposal site which is in conformity with the requirements of ORS Chapter 459 and the administrative rules and standards promulgated pursuant thereto. Such disposal shall be at periods when weather permits handling and disposal, but not less than once each year.

(b) Hazardous Solid Wastes. Containers for hazardous wastes shall be marked to designate the content as toxic, explosive or otherwise hazardous and shall be designed to give protection to the collector and disposal site operator.

38-025 TRANSPORTATION.

(1) Collection Vehicle Construction and Maintenance.

(a) Solid waste collection vehicles shall be constructed, loaded and operated so as to prevent dropping, leaking, sifting or escaping of solid waste from the vehicle on the public highway.

(b) When hauling solid waste which may be blown or sift from the vehicle, collection vehicles shall have a cover which is either an integral part of the vehicle or which is a separate cover of suitable materials with fasteners designed to secure all sides of the cover to the vehicle and shall be used while in transit.

(2) Transfer Stations. Transfer stations, drop boxes or other intermediate means of holding or transferring solid waste between the point of origin and the transporting vehicle shall be considered as part of the collection and transport system. Such auxiliary units shall be constructed to prevent odors, leaking, sifting or blowing of solid waste and to prevent rodent and insect infestation. Areas around such equipment shall be cleaned at regular intervals, but not less than once weekly.

(3) Cleaning. Vehicles, transfer stations, drop boxes or other intermediate devices used in transporting solid waste shall be cleanable and shall be cleaned at

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weekly intervals to reduce odors, insects, rodents or other nuisance conditions. Waste water from the cleaning process of containers of non-hazardous waste shall be disposed of in a sewer system, or at the solid waste disposal site, or by other methods approved by the state or county health department.

ADDENDUM E

BACKGROUND INFORMATION NECESSARY FOR PLANNING

A. Political Structure

To understand the problem of waste disposal, general information about the state is helpful and political structure is one part of the information.

1. State Government

Oregon state government is divided into executive, legislative and judicial branches.

(a) Executive - The chief executive is the governor. He, the secretary of state and the state treasurer are the major elected officials of the executive branch. There is no lieutenant governor. In 1969, the Oregon Blue Book listed over 100 departments, boards, commissions and committees functioning as permanent agencies within the executive branch.[5]

(b) Legislative - The Oregon State Legislature, known officially as the Legislative Assembly, convenes every odd-numbered year. There are two houses, a Senate and a House of Representatives. Thirty senators are elected from 16 senatorial districts every four years, and 60 state representatives are elected from 26 representative districts every two years. Representation in both houses is apportioned according to population.

(c) Judicial - The judicial branch consists of a supreme court, a special tax court created in 1958, circuit courts and district courts. Oregon's 36 counties are divided into 19

courts by non-partisan ballots. District courts are established in 19 counties with population exceeding 15,000.

Prosecuting attorneys, who are the law enforcement officers of the laws of the state, may be elected by district or by county and serve under the direction of the state attorney general who is also an elected officer. There are 36 district attorneys, 1 for each county in the state.

c. Local Government

(a) County Government - There are 36 county governments in Oregon. The governing body of each county operates under the general rules of the state and consists of 3 elective positions. This body may be referred to as the "county court" or "board of county commissioners", depending on county charter or state law.

The main functions of county government are to construct county roads and to administer, as required or permitted by state law, programs in the fields of law enforcement, taxation, elections, records, social welfare, health and sanitation, land-use planning and other related services.

Four counties have adopted home-rule charters (Lane, Hood River, Washington and Multnomah Counties) as authorized by the State Constitution. Under home-rule, counties are empowered to enact local legislation on matters of county concern, even to establishing special county service districts. This local legislation must be at least equal to state law.

Some state agencies such as welfare and health and sanitation depend greatly on county personnel, supported by county

funds, to administer the programs.

Plans for remodeling state government will materially affect basic programs now being supported by county government.

(b) City Government - City home-rule has been allowed as a matter of constitutional principle since the early settling of Oregon. Municipalities draw up their own charters and vary their systems of government to suit their own needs. There are 229 incorporated cities in Oregon. The ordinances passed by cities cannot conflict with state law.

3. Regional or District Governments

There have been established numerous districts for special services within cities and counties. Some of these districts overlap geographically and in types of services allowed within counties. The main purpose for establishing these special districts has been for a tax base to support the specialized services.

A recent development has been the formation of regional councils of government which may include a number of county and city governments. Three areas in Oregon have had these administrative agreements in operation for some time. One is the Council of Governments in Marion-Polk Counties. Another is the Columbia Region of Associated Governments which includes Clackamas, Multnomah, Washington and Clark County in Washington. Columbia County is a cooperating county, but not a member of the latter association. The third is the Central Lane Planning Council.

Another special regional grouping overlapping county lines are the air pollution control regions of which there are 3. The Lane County Air Quality Control Region is a single county region.

Mid-Willamette Valley Air Pollution Authority includes Polk, Marion, Yamhill, Linn and Benton Counties. Columbia Region Air Pollution Authority includes Multnomah, Clackamas and Columbia Counties.

4. Governmental Reorganization

Under the direction of the Office of the Governor, a committee developed a plan for reorganization of state government to be accomplished in the 1970s.

The state legislature in 1969 moved to adopt some of the reorganization plan to reduce the number of boards and commissions. Some examples of changes were in the Executive Department, the Department of Transportation and the Environmental Quality Control Commission.

The latter commission is directly involved with planning air and water quality and solid waste.

Also established by the 1969 legislature is a Constitution Revisions Study Committee.

B. Environmental Resources

The natural environment of the state has many resources that are important to man and influence the uses he makes of them and his adaption to them.

1. Geography - Oregon covers a total of 62,067,840 acres, or 96,981 square miles of which 733 square miles is water surface.

The outstanding geographical feature of the state is the Cascade Range running north and south down its entire length, about 100 miles inland from the Pacific Ocean. Over 85% of Oregon's population lives within the western one-third of the state. This area

is generally moderate in climate and well supplied with water. The remaining two-thirds of the state is located east of the Cascades and experiences greater extremes in climate. This area has many portions which are arid.

Oregon is divided into ten physiographic regions. Their major characteristics are:

(a) Coastal Plain - Scattered plains, alternating sand dunes and marine terraces generally extending only a mile or two in from the Pacific Ocean.

(b) Coast Range - Broad, gentle folds or marine sediments, rarely exceeding 1,700 feet in the north and 3,500 feet in the south. Heavy precipitation, many short east-west rivers providing valleys through which the coast has access to the Willamette Valley.

(c) Klamath Mountains - Sharp ridges and deep, narrow valleys arranged haphazardly, and summit levels generally between 4,000 and 6,000 feet. Extreme isolation of parts of the region. Population is concentrated in the Rogue River Valley which provides for irrigated farming.

(d) Willamette Valley - Only large lowland west of the Cascades, containing two-thirds of the state's population, its largest urban centers, much of its industry and most valuable agricultural land. Willamette River flows north to meet the Columbia at Portland. Serious flood hazard and poor drainage conditions in part of the region.

(e) The Cascades - Form a continuous barrier between eastern and western portions of the state with limited through routes.

Heavier precipitation on the western slope causing distinct differences in climate, vegetation and soils and resulting in very different basic economies between the western and eastern portions of the state. The highest point in the state is Mt. Hood at 11,245 feet.

(f) Deschutes-Umatilla Plateau - Sloping gently from 3,000 feet in the south to a few hundred feet overlooking the Columbia River, the region is cut by several streams which have formed deep canyons. Interstream areas are mainly level and have been little affected by erosion which makes them suitable for dryland farming wherever the soil is sufficiently deep. Vegetables and fruits are produced in a few irrigated valleys of the plateau.

(g) High Lava Plains - Consist largely of layers of lava covered with volcanic debris. Extensive interior drainage, lack of precipitation, high elevation and poor soil restrict agriculture to limited grazing in much of the area. Some irrigation near Bend, its major urban center.

(h) Basin and Range - Long, narrow, north-south lava ranges interspersed with broad, shallow basins filled with volcanic debris. Shallow and usually temporary lakes, generally sparse vegetation. Exception is Klamath Lake, which receives a more regular flow from the Cascades. Major population center is Klamath Falls around which irrigation has been developed.

(i) Owyhee Uplands - Covered largely by volcanic matter, but lower elevations and better drainage than Basin and Range. Scattered peaks rise to over 6,000 feet, but irrigated

valleys lie as low as 2,700 feet. Population sparse, concentrated in small areas where level terrain, good soil and availability of water permit intensive cultivation of sugar beets, alfalfa and truck crops. Elsewhere grazing of cattle and sheep on low unit-capacity lands.

(j) Blue Mountains - The term "Blue Mountains" applies to the hilly and mountainous land of northeastern Oregon which includes a variety of uplands and intervening valleys, complex in topography and rock type. Gold, chromite and mercury can be found in the Wallowa, Greenhorn and Elkhorn Mountains although, at present, mining is of secondary economic importance to timber. Agriculture is also found in the valleys which, although relatively small, has developed fertile soil where vegetables, fruits and irrigated hay are grown. Unirrigated slopes are generally suitable for dry farming. Streams flowing east and north to the Snake River provide an important source of hydroelectric power.

2. Geology and Soils

The soils of western Oregon are generally acid and moderately to highly leached, are derived principally from basaltic rocks and are of a somewhat heavy texture. On the coast and along the coastal streams, the alluvial soils are characterized by a high percentage of organic matter, severe acidity, low nitrogen and poor drainage, and are used primarily for the production of forage crops.

The lowland soils of the Willamette Valley are derived from alluvial material, are only moderately acid, contain less organic

materials and are frequently deficient in nitrogen. Inadequate drainage restricts the full use of the Valley for crop production. The uplands of the Willamette Valley and the foothills of the coast range are generally well drained. A high percentage of these uplands is covered by forests and grass.

The soils of eastern Oregon are more varied. The most extensive are those of the semi-arid plateaus, but there are also large areas of mountain and high plateau which support forests on well-drained, acid soils where precipitation approximates that of the Willamette Valley. Productive irrigated pastures may graze several cows per acre, while desert shrub areas may require 75 acres or more per cow, with great variations sometimes occurring within short distances.

Only 10% of Oregon's land is suitable for cultivation, and this land lies primarily within the Willamette Valley in western Oregon and in the brown soil region south of the Columbia River in eastern Oregon. The remaining portion of the state is nearly all capable of supporting grazing and forestry with the better suited lands lying at lower elevations and those less well suited located primarily in the high regions of southern Coast Range, the Cascade Range and the Klamath, Blue and Wallowa Mountains.

3. Climatology

Oregon's geographical division by the Cascade Range provides for two distinct climatic regions. West of the Cascades, it is generally a temperate, moist, marine climate and east of the Cascades, it is a drier continental climate with a greater annual temperature range.

In western Oregon, average annual rainfall is generally over 30 inches. Along the coast, annual precipitation is nearly 75 inches, rising to as much as 130 inches in the higher elevations of the northern section of the Coast Range. In the valleys, it varies from less than 20 inches in the Medford area to more than 50 inches all along the center of the Willamette Valley where the state's principal cities, Portland, Eugene and Salem, are located.

On the eastern side of the Cascades, precipitation rate falls off rapidly and the interior generally has only 10 to 20 inches per year. About 80% of eastern Oregon experiences less than 15 annual inches. Precipitation becomes heavier again in the mountains of the northeastern section of the state to as much as 40 inches annually in part of the Wallowa Mountains.

Two-thirds of the annual rainfall in western Oregon occurs between September and April. In eastern Oregon, only half of the annual rainfall occurs during this period.

Along the coast, snowfall generally averages 1 inch per year; in the Willamette Valley, between 6 and 13 inches; and in the Rogue Valley, 20 inches. These snows usually stay on the ground a short time and do not ordinarily exceed 6 inches in depth.

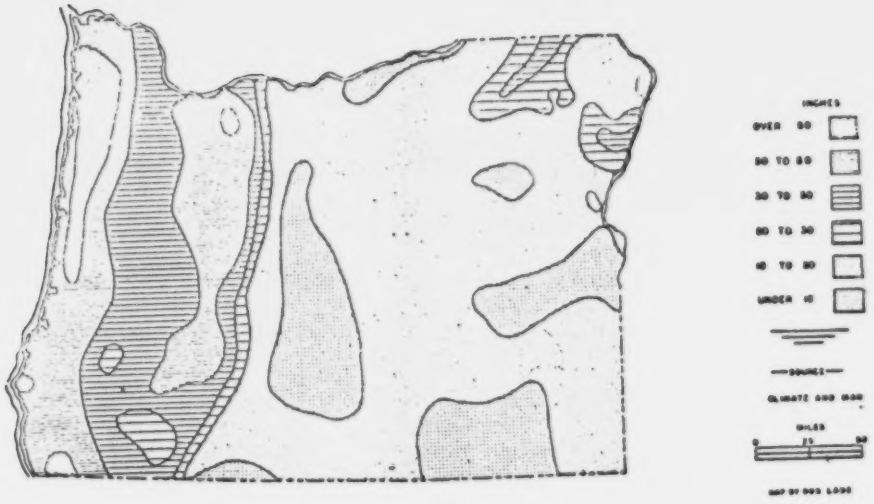
In the Cascades, annual snowfall averages over 500 inches in many places, while most areas of eastern Oregon experience between 10 and 50 inches, depending on elevation. Snows remain on the ground longer than in western Oregon.

Temperature along the coast never fall below zero and rarely exceed 100 degrees. In the Willamette Valley, below-zero readings are rare and those over 90 degrees are usually limited to six or

eight days per year. From November through March, cloudy weather persists much of the time, but from late spring through early fall, the region is frequently clear.

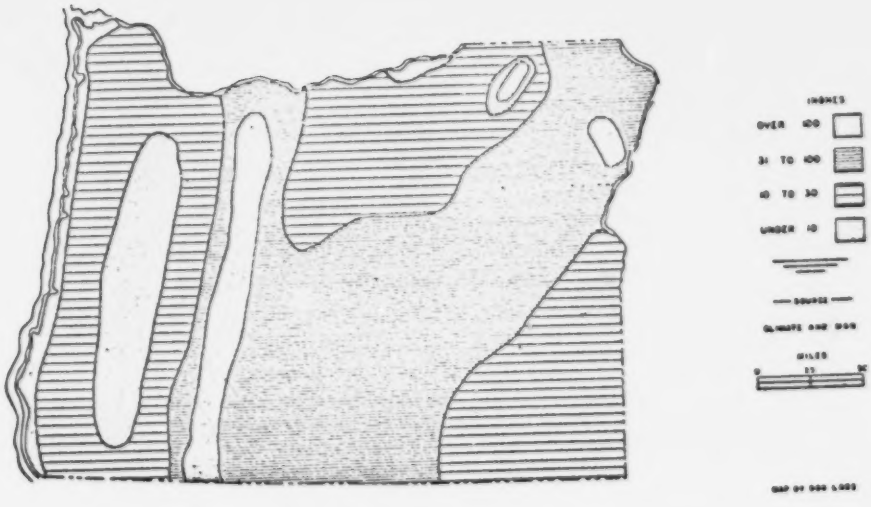
In eastern Oregon, extremes in temperature of 54 degrees below zero and 119 degrees above have been experienced. Generally, January temperatures range between 15 and 30 degrees and those in July range between 65 and 80 degrees. The cloudy weather experienced by the western portion of the state frequently extends over into eastern Oregon during the winter months. In general, however, sunshine is most prevalent in the southeastern corner of the state and decreases steadily toward the northwest corner.

PLATE II
AVERAGE ANNUAL PRECIPITATION



Source: Oregon Water Resources Board

PLATE III
AVERAGE ANNUAL SNOWFALL



Source: Oregon Water Resources Board

4. Water and Drainage Basins

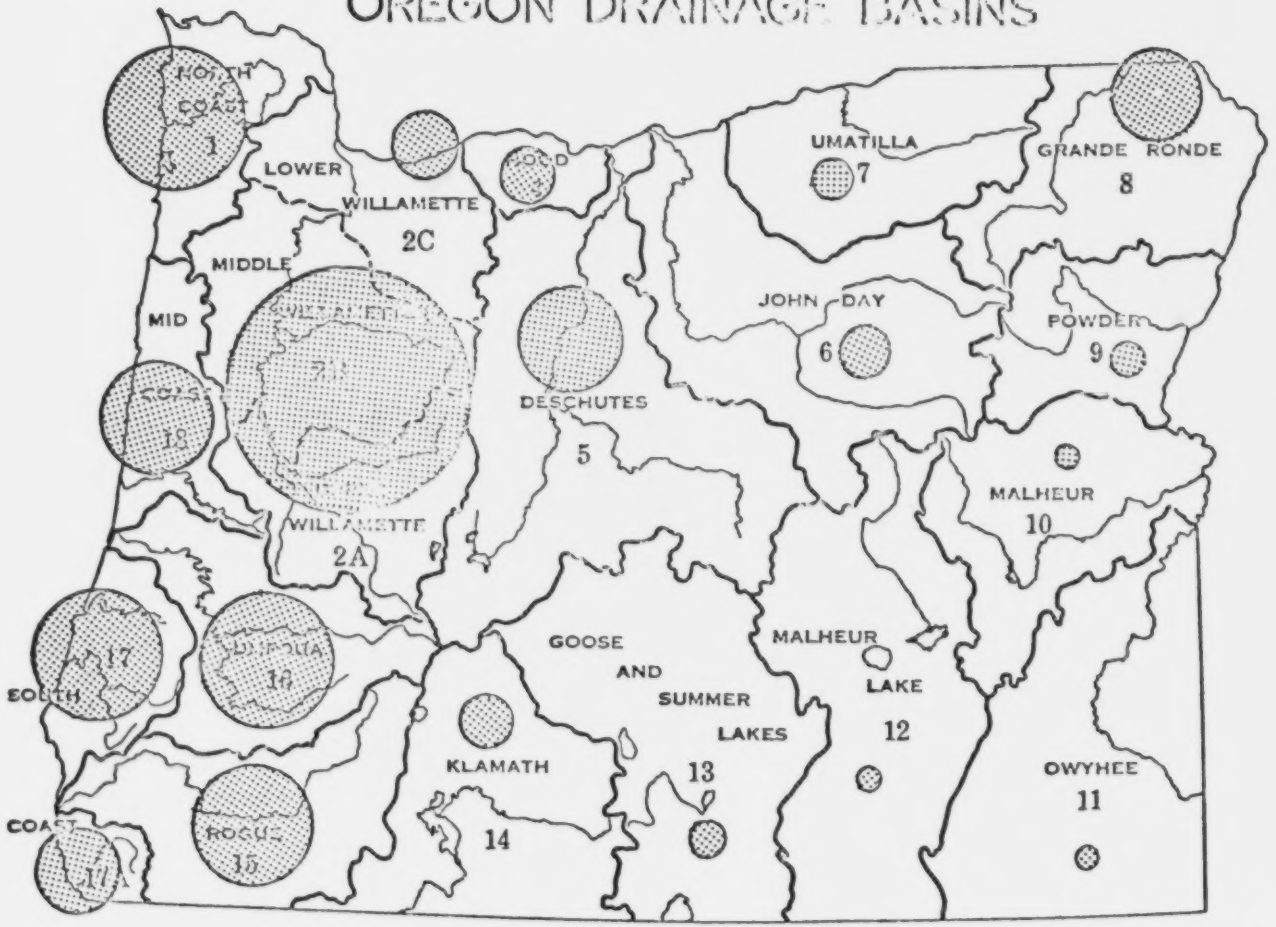
Oregon's water resources are one of the state's major assets and contribute significantly to its economic development. It is estimated that approximately 50 million acre-feet of annual run-off occurs from Oregon's rivers and streams, in addition to the more than 180 million acre-feet annual average run-off of the Columbia River.

The state's principal problem in water supply at the present time is the unequal distribution not only between areas, but between times of the year within the same areas. Some areas have high flood danger and saturated ground during one seasons with insufficient supply during the opposite season. Western Oregon, where heavy rains fall during the winter months, has high water at that period and low water during the summer months. These heavy rains affect the ground water tables and there is generally a "lag effect" between the rainfall periods and the ground water change. For instance, ground water tables may remain low until December, raise and remain high until June or later and then recede.

In eastern Oregon where the rainfall is considerably less, high waters generally come in the spring when winter snows melt and winter is frequently the low-water period. Spring run-off will affect ground water tables until late June and irrigation waters will affect the ground water tables in late summer and fall in eastern Oregon.

PLATE IV

OREGON DRAINAGE BASINS



STATE WATER RESOURCES BOARD
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C. Human Resource Planning

1. Land-Use

Oregon has a total of 62,067,840 acres of land. Less than one-half of 1% of this total is occupied by urban development; less than 10% is in agricultural use; 85% of the total is in forests and grazing; parks and recreation occupy about 2-1/2% of the total and a small area of 300,000 acres are of high elevations, in snow pack or severely eroded (Table I).

Intensive agricultural use is heaviest in the Willamette Valley and consists of fruit and vegetable production. Dry-land farming of grains and cattle production are located in the eastern part of the state.

2. Land Ownership

Fifty-six per cent of the land in Oregon is in public ownership and over 50% is under control of the federal government. State government controls about 3% of the land and local government controls 1% of the total (Tables II & III).

3. Land-Use Planning

During the past 10 years, an effort has been made through the Bureau of Municipal Research at the University of Oregon to promote counties into establishing planning and zoning commissions. The purpose of these planning commissions is to develop better land-use and development throughout the county.

The 1969 Legislature took action to require <u>all</u> counties to establish planning and zoning by 1971, or the state would assume the planning activity. There is also an established Legislative Interim Committee of the Oregon Legislature to study the future use of public lands.

TABLE XXIII

LAND USE IN OREGON COUNTIES

Percentage of Total Land Area in Ten Use-Categories

County	Urban	Industrial	Military	Intensive Agriculture	Dryland Farming	Forests	Parks	Conservation	Grazing	Non-Productive Land	Total Land Area
Baker	.23			9.70		38.61		.66	49.38	1.42	100.00
Benton	.57			34.82		57.65		2.74	4.22		100.00
Clackamas	1.76			19.50		72.22		.26	5.79	.53	100.00
Clatsop	.77		.29	2.12		90.85	1.54		3.18	1.25	100.00
Columbia	1.17		.12	12.73		77.10		4.67	3.04	1.17	100.00
Coos	.82			4.67		87.23	.29		6.99		100.00
Crook	.05			3.46		26.37			70.12		100.00
Curry	.14					81.19	1.29	5.41	3.37	8.60	100.00
Deschutes	.10			3.70		52.74		3.48	38.56	.50	100.00
Douglas	.27			4.38		86.35	.02		8.71		100.00
Gilliam					38.02				61.98		100.00
Grant				1.99		66.09	.07	1.26	30.27	.32	100.00
Harney	.02			1.24	.06	6.55		2.39	88.97		100.00
Hood River	1.20			8.83		80.09	.15	1.80	5.39	2.54	100.00
Jackson	.29		.08	7.86		87.85		.13	3.79		100.00
Jefferson	.13			6.30	1.17	33.33	.60	3.24	54.88	.35	100.00
Josephine	.18			3.00		82.38		.05	6.18	8.21	100.00
Klamath	.35			7.34		70.39	3.68	2.12	15.48	.64	100.00
Lake	.01			2.52		23.47		7.74	66.26		100.00
Lane	1.78			8.85		81.29		5.08	2.58	.16	100.00
Lincoln				1.13		91.37			7.50		100.00
Linn	.33			25.02		65.86		5.62	2.71	.46	100.00
Malheur	.07			4.95	.12	.65			94.21		100.00
Marion	4.13			47.46		42.71	1.25	1.32	2.25	.88	100.00
Morrow		7.16	4.02	.99	30.88	17.87			39.08		100.00
Multnomah	25.60	.48		20.51		50.08		3.02		.31	100.00
Polk				41.68		51.58			6.74		100.00
Sherman	.19				60.76				39.05		100.00
Tillamook	.48		.20	4.91		85.95	1.02		7.44		100.00
Umatilla	.28		.23	2.65	32.84	34.24	.02	.35	29.11		100.00
Union	.53		.08	2.15	9.70	65.87		4.11	17.56		100.00
Wallowa	.07			2.22	1.90	52.56		7.60	35.65		100.00
Wasco	.32			3.96	10.17	31.58		.92	53.05		100.00
Washington	3.19			46.28		50.53					100.00
Wheeler				.40		30.51			69.09		100.00
Yamhill	1.70			45.16		52.71				.43	100.00
State	.49	.16	.10	6.52	3.33	44.84	.32	2.25	41.50	.49	100.00

TABLE XXIV

PUBLIC LAND OWNERSHIP IN OREGON

County	Total Land Area In Acres	Public Land Ownership in Acres				Public Land Ownership As Percent Of Total Land Area			
		Total	Federal	State	Local	Total	Federal	State	Local
Baker	1,973,760	981,440	948,426	19,865	13,149	49.7	48.1	1.0	0.7
Benton	427,520	104,247	74,081	18,841	11,325	24.4	17.3	4.4	2.6
Clackamas	1,209,600	653,551	613,480	10,942	29,129	54.0	50.7	0.9	2.4
Clatsop	524,800	168,245	5,610	156,868	5,767	32.1	1.1	29.9	1.1
Columbia	413,440	38,436	11,936	16,170	10,330	9.3	2.9	3.9	2.5
Coos	1,031,040	342,359	248,446	63,904	30,009	33.2	24.1	6.2	2.9
Crook	1,907,200	983,795	944,042	28,274	11,479	51.6	49.5	1.5	0.6
Curry	1,038,080	686,798	671,442	11,144	4,212	66.2	64.7	1.1	0.4
Deschutes	1,937,280	1,602,855	1,435,735	35,155	131,965	82.7	74.1	1.8	6.8
Douglas	3,239,680	1,733,376	1,646,906	57,469	29,001	53.5	50.8	1.8	0.9
Gilliam	775,040	53,973	41,715	6,989	5,269	7.0	5.4	0.9	0.7
Grant	2,900,480	1,746,065	1,729,750	12,037	4,298	60.2	59.6	0.4	0.1
Harney	6,484,480	5,019,921	4,713,874	229,859	76,158	77.4	72.7	3.5	1.2
Hood River	338,560	249,124	211,365	5,776	31,983	73.6	62.4	1.7	9.4
Jackson	1,802,880	952,842	915,056	10,715	27,071	52.9	50.8	0.6	1.5
Jefferson	1,148,160	309,113	296,645	6,453	6,015	26.9	25.8	0.6	0.5
Josephine	1,040,000	725,511	706,840	12,278	6,393	69.8	68.0	1.2	0.6
Klamath	3,822,720	2,114,585	2,053,747	47,486	13,352	55.3	53.7	1.2	0.3
Lake	5,292,800	3,951,308	3,810,720	125,333	15,255	74.7	72.0	2.4	0.3
Lane	2,926,720	1,782,487	1,725,403	37,194	19,890	60.9	59.0	1.3	0.7
Lincoln	630,400	227,490	195,239	23,979	8,272	36.1	31.0	3.8	1.3
Linn	1,468,160	600,184	557,018	28,154	15,012	40.9	37.9	1.9	1.0
Malheur	6,316,800	4,981,659	4,683,722	276,237	21,700	78.9	74.1	4.4	0.3
Marion	750,720	283,508	231,308	37,216	14,984	37.8	30.8	5.0	2.0
Morrow	1,317,760	324,349	291,777	23,935	8,637	24.6	22.1	1.8	0.7
Multnomah	271,360	100,612	74,856	12,977	12,779	37.1	27.6	4.8	4.7
Polk	472,960	55,941	42,390	8,708	4,843	11.8	9.0	1.8	1.0
Sherman	531,200	54,908	47,086	3,857	3,965	10.3	8.9	0.7	0.7
Tillamook	713,600	474,388	145,351	316,082	12,955	66.5	20.4	44.3	1.8
Umatilla	2,067,840	510,659	455,719	27,320	27,620	24.7	22.0	1.3	1.3
Union	1,300,480	646,213	628,904	11,032	6,277	49.7	48.4	0.8	0.5
Wallowa	2,033,920	1,185,439	1,158,126	13,163	14,150	58.3	56.9	0.6	0.7
Wasco	1,527,680	281,255	251,601	17,325	12,329	18.4	16.5	1.1	0.8
Washington	458,240	79,127	12,385	53,438	15,304	17.3	2.7	11.7	2.9
Wheeler	1,092,480	269,617	258,239	6,587	4,991	24.7	23.6	0.6	0.5
Yamhill	453,760	86,053	68,581	1,840	15,632	19.0	15.1	0.4	3.4
Unallocated by county		8,846	8,846						
Total	61,641,600	34,370,499	31,916,368	1,774,636	679,500	55.8	51.8	2.9	1.1

Note: Some totals do not add due to rounding.

TABLE XXV

FEDERAL LAND OWNERSHIP IN OREGON BY AGENCY

IN RANK ORDER OF SIZE OF HOLDINGS

	Acres
Bureau of Land Management	15,937,354
Forest Service	15,001,833
Fish and Wildlife Service	444,024
Bureau of Reclamation	173,447
National Park Service	160,877
Navy	98,646
Corps of Engineers	59,473
Army	19,332
Agricultural Research Service	14,594
Bonneville Power Administration	1,511
Bureau of Indian Affairs	1,219
Federal Aviation Agency	971
Maritime Administration	917
Air Force	802
Coast Guard	686
Veterans Administration	474
Federal Communications Commission	109
Bureau of Mines	47
Post Office Department	15
General Services Administration	7
Public Health Service	1
Total of 21 Agencies	31,916,368 (a)

(a) Does not add to total due to rounding.

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4. Public Transportation

(a) Highway

As of July, 1962, Oregon's highway and road network totaled 74,968 miles. Of this, 7,577 miles were with the State Highway System, 34,418 miles were county roads, 4,398 miles of city streets and the remaining 28,075 miles were roads administered by federal agencies such as forest roads, national park roads and Indian reservation roads.

Oregon has two Interstate Highways: Route 5, the Pacific Highway, runs from Washington to California through the Willamette Valley in western Oregon; and Route 80N, extending from Portland east along the Columbia River and south along the eastern edge of the state to Ontario and Boise, Idaho. Two other highways carry traffic north and south through Oregon, the coast route and Highway 97 through Bend in central Oregon. Two east and west highways, besides 80N, run through the central part of the state through Bend.

In 1963, 530 companies engaged in public transportation services. Ninety-four (94) carried passengers and four-hundred and thirty-six (436) carried freight.

(b) Rail Transportation

Principal railway companies in the state are the Southern Pacific and the Union Pacific. The Southern Pacific operates 1,800 miles of track primarily in the Willamette Valley and western Oregon and parallels Highway 5. The Union Pacific operates 1,600 miles of track carrying traffic east from Portland along the Columbia River and south to Ontario and

PLATE V

TRAFFIC FLOW - 1962

SOURCE: OREGON OUTDOOR RECREATION

Boise, Idaho, paralleling Highway 80N for the most part.

A jointly-used line operated by Great Northern connects the Union Pacific and Southern Pacific lines in central Oregon and runs through Bend, paralleling Highway 97.

(c) Water Transportation

Waterways offering transportation to serve Oregon are the Columbia River, its tributary, the Willamette River, and the Pacific Ocean. The Port of Portland is easily reached by ocean-going vessels and some can go to The Dalles. Barge traffic can go regularly as far east as Pasco, Washington and seasonally as far as Lewiston, Idaho. Barge traffic can also go up the Willamette as far as Corvallis.

Oregon's principal port is Portland. There are 25 port authorities in the state with two major ports on the Pacific Ocean - Coos Bay and Astoria.

(c) Air Transportation

There are 188 airports, landing fields and airstrips in Oregon. The state is served by 8 scheduled airlines and one non-scheduled freight carrier with connections to Hawaii, Alaska, Canada, Mexico, England and the Far East.

5. Population Trends

According to forecasts by the Oregon State Board of Census, Oregon's population will reach 2,477,000 by 1985, an increase of 708,000 people, or 28.6% growth over a 25-year period. Nearly half of this growth, or 342,000 people, is expected to occur in the 3 counties which make up the Portland metropolitan area.

Lane County, especially in the Eugene-Springfield area, may ex-

pect 107,000 people and the 5 counties between Portland and Eugene are expected to add 109,000 people.

In 1960, approximately two-thirds of Oregon's population was concentrated in the Willamette Valley area and by 1985, this concentration is forecasted to reach nearly 70%.

The eastern counties are expected to continue to lose population to the western part of the state and show an over-all slower growth rate.

These growth rates will not affect each age group uniformly. The largest proportionate increases will be generally in the older and younger age groups. The group between 35-54 years will show the smaller increases or losses. This forecast included natural increase by excess of births over deaths, and migration both in and out of the state due to employment opportunities.

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